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BULLETIN OF DUKE UNIVERSITY

Financial Report



1965-66

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BULLETIN

OF

DUKE UNIVERSITY

FINANCIAL REPORT

Year Ended June 30, 1966



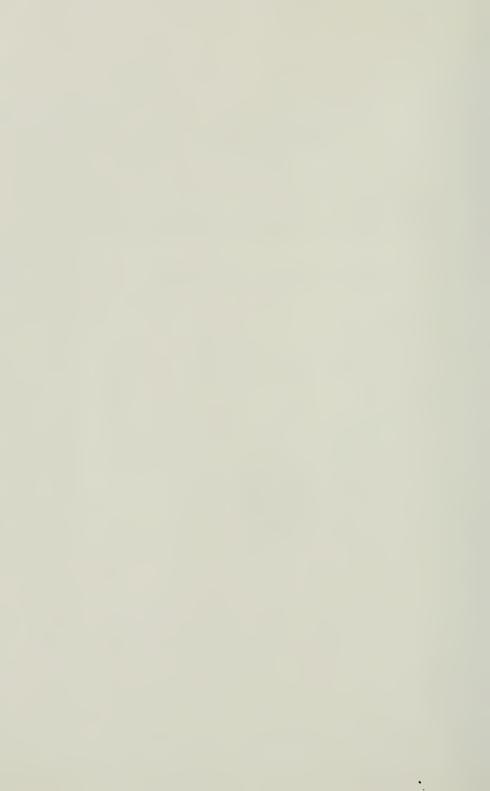


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^{*}Died July 7, 1965.

LETTER OF TRANSMITTAL

To the Board of Trustees of Duke University:

We submit for your examination and information the annual financial report of Duke University which shows in some detail the results of the operation for the year ended June 30, 1966.

The figures contained in this report have been verified by our certified public accountants and the certificate of Peat, Marwick, Mitchell & Co. is included as a part of this report.

It will appear from the Statement of Current Revenues, Expenditures, and Appropriations that the University, exclusive of the Hospital, closed the year with a net income from operations of \$74,691. Duke Hospital operated at a net loss of \$173,448 making the deficit for the University as a whole amount to \$98,757. This deficit has been charged to the Reserve for Undistributed Income.

The following summary and comparison of Educational and General Revenues and Expenditures will be of interest.

	1966		1965	
Revenues	Amount	Per Cent of Total	Amount	Per Cent of Total
Endowment income:				
The Duke Endowment Funds held by University	\$ 4,432,068 3,273,976	11% 8	$\begin{array}{c} \$ \ 4,447,274 \\ 2,944,242 \end{array}$	13%
Turids field by Cliffersity				
	7,706,044	19	7,391,516	21
Loyalty funds	461,446	1	412,092	1
Gifts and grants:				
Research	13,256,801	34	11,479,942	32
Training	3,661,764	10	2,337,560	7
Special programs	1,587,175	4	3,290,884	9
Libraries	54,632	_	26,687	_
Professorships	257,178	1	259,200	1
Current expenses	371,210	1	419,304	1
	19,188,760	50	17,813,577	50
Tuition and fees	8,110,943	21	7,036,315	20
Investment income	287,075	1	170,979	1
Departmental sales and service	es 2,923,673	8	2,503,046	7
	\$38,677,941	100%	\$35,327,525	100%
77 114				
Expenditures	0 100 400	0	1 000 040	~
Administration	2,122,432	6	1,688,049	5 3
General operations Instruction	710,962	$\frac{2}{29}$	785,249	31
Research programs	10,478,021 $12,727,696$	$\frac{29}{35}$	$9,725,869 \\ 11,389,467$	36
Training programs	3,364,659	9	2,613,098	
Special programs	2,919,523	8	1,614,328	8 5 5 7
Libraries	1,565,067	4	1,449,325	5
Physical plant	2,473,705	7	2,183,634	7
	\$36,362,065	100%	\$31,449,019	100%

The Endowment Funds of the University are invested in securities in accordance with an investment policy established by the Investment Committee of the Board of Trustees. A list of securities held at June 30, 1966 begins on page 66 of this report. A summary, including both cost and market values, of investments by funds held at June 30, 1966 is included as item four of the Notes to Financial Statements.

The Balance Sheet includes only those assets to which title actually vests in Duke University and consequently do not include any portion of the indivisible Corpus of The Duke Endowment, the income from which, subject to the terms of the Trust Indenture, accrues to Duke University as one of the several beneficiaries. Nor do the accounts include the principal funds of trusts independently administered for the benefit of Duke University; such as, the Angier B. Duke Memorial, Inc., the Frederic M. Hanes Bequest, the Frederic M. Hanes Memorial Trust, the Albert Anderson Bequest, the James A. Gray Foundation, the Mary Alyse Smith Scholarship Fund, and the Durham Foundation: Alyse Smith Cooper Fund.

Respectfully submitted, G. C. Henricksen Vice President for Business and Finance

S. C. HARWARD Comptroller

September 1, 1966

REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

Board of Trustees Duke University:

We have examined the balance sheet of Duke University as of June 30, 1966, the related statement of current revenues, expenditures, and appropriations, and the several statements of changes in fund balances for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet, the statement of current revenues, expenditures, and appropriations, and the several statements of changes in fund balances present fairly the financial position of Duke University at June 30, 1966 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles which have been applied on a basis consistent with that of the preceding year except for certain changes in reporting (which we approve) as described in note 11 of the notes to financial statements. The current year's supplementary data included in Schedules A-M have been subjected to the same auditing procedures and, in our opinion, are stated fairly in all material respects when considered in conjunction with the basic financial statements taken as a whole.

PEAT, MARWICK, MITCHELL & CO.

Greensboro, N. C. September 1, 1966

BALANCE SHEET As of June 30, 1966 ASSETS

Current Funds: General:			
Pooled cash and securities:		m.	410 500
Cash Marketable securities, at cost or amortized		\$	419,563
value (note 4) Due from endowment funds		ŧ	5,349,224 717,117
Due from endowment runds			
Less equity of other funds			5,485,904 5,293,141
A			1,192,763
Accounts receivable, after deducting \$3,606,914 which is a 100% reserve against			
hospital patients' accounts			529,622
Inventories, at cost Deferred charges			1,404,457 $127,432$
Total current general funds			3,254,274
Restricted:	4,434,200		,,
Notes and accounts receivable	7,737		
Investments, at cost or amortized value (note 4)	4,648,107		
=			
Total current restricted funds			9,090,044
Total current funds		1:	2,344,318
STUDENT LOAN FUNDS: Equity in pooled cash and securities	346,507		
Notes receivable Investments, at cost or amortized value (note 4)	2,347,612 87,376		
Total student loan funds Endowment Funds:			2,781,495
Due from unexpended plant funds	802,628		
Investments, at cost or amortized value (note 4)	60,466,173		
Total endowment funds PLANT FUNDS:		6	1,268,801
Unexpended plant funds:			
Equity in pooled cash and securities Investments, at cost or amortized value	167,619		
(note 4)	9,015,534		
Total unexpended plant funds	9,183,153		
Invested in plant (note 3): Land, buildings, equipment, and library books	110,660,935		
Total invested in plant	110,660,935		
Total plant funds		11	9,844,088
Carried Forward		\$19	6,238,702

BALANCE SHEET

as of June 30, 1966

LIABILITIES AND FUND BALANCES

CURRENT FUNDS: General:	
Accounts payable and encumbrances	\$ 1,410,360
Students' deposits Deferred income:	265,733
Loyalty funds (1965-66, expendable for general purposes in 1966-67) \$ 508,651	
Other 410,750	919,401
Liability for post retirement benefits Fund balances: Reserves:	113,500
Reappropriation for hospital operations 150,000	
Married student housing $3-1/2\%$ serial bonds 112,635	
262,635	
Unappropriated 282,645	545,280
Total current general funds	3,254,274
Restricted—Schedule C: Purchase orders and other encumbrances Fund balances—net (note 9) 4,235,749 4,854,295	
Total current restricted funds	9,090,044
Total current funds	12,344,318
STUDENT LOAN FUNDS: Fund balances—Schedule B 2,781,495	
Total student loan funds	2,781,495
ENDOWMENT FUNDS (notes 1 and 10): Due to current general funds 717,117	
Principal of endowment funds—Schedule A 60,551,684	
Total endowment funds	61,268,801
PLANT FUNDS: Unexpended plant funds:	
Due to endowment funds (note 7) 802,628 Fund balances (including outstanding purchase	
orders of \$336,297)—net (notes 8 and 9) 8,380,525	
Total unexpended plant funds 9,183,153	
Invested in plant:	
3-1/2% serial bonds payable (note 5) 2,322,500 Notes payable (note 6) 1,685,920	
Net investment in plant 106,652,515	
Total invested in plant 110,660,935	
Total plant funds	119,844,088
Carried Forward	\$196,238,702

BALANCE SHEET—Continued Assets—Continued

Brought Forward		\$196,238,702
Agency Funds: Equity in pooled cash and securities Student loan notes receivable Other accounts and notes receivable Investments, at cost (note 4) Inventories (\$53,600) and deferred charges	\$ 344,8 604,70 310,3 464,8 68,5	04 38 24
Total agency funds		1,793,187
		\$198.031.889

BALANCE SHEET—Continued Liabilities and Fund Balances—Continued

Brought Forward

\$196,238,702

Agency Funds: Sundry liabilities Fund balances

\$ 121,722 1,671,465

Total agency funds

 $\frac{1,793,187}{\$198,031,889}$

STATEMENT OF CURRENT REVENUES, EXPENDITURES, AND APPROPRIATIONS

Year Ended June 30, 1966

Revenues EDUCATIONAL AND GENERAL: Endowment income:	General	Restricted	Total
Duke Endowment (note 1) Funds held by University	\$ 4,432,068 2,998,604	275,372	4,432,068 3,273,976
	7,430,672	275,372	7,706,044
Loyalty funds	461,446		461,446
Gifts and grants: Research—Schedule D Training—Schedule E Special programs—Schedule F Libraries—Schedule G Professorships—Schedule H Current expenses—Schedule I	1,639,197 241,251 31,038 — — 371,210	11,617,604 3,420,513 1,556,137 54,632 257,178	13,256,801 3,661,764 1,587,175 54,632 257,178 371,210
	2,282,696	16,906,064	19,188,760
Tuition and fees	8,004,595	106,348	8,110,943
Investment income	10,183	276,892	287,075
Departmental sales and services	323,557	2,600,116	2,923,673
	18,513,149	20,164,792	38,677,941
RELATED ACTIVITIES: Duke Hospital (note 10) Other	9,432,331 20,384	=	$9,432,331 \\ 20,384$
	9,452,715	_	9,452,715
Auxiliary Enterprises	6,021,031		6,021,031
STUDENT AID: Gifts for fellowships and scholarships —Schedule J Designated scholarships Endowment income Investment income	42,772 	966,725 213,125 334,351 2,934	1,009,497 213,125 334,351 2,934
	42,772	1,517,135	1,559,907
App angers post-isted for de arrow ditame	34,029,667	21,681,927	55,711,594
App excess restricted funds expenditures and appropriations over revenues received during year		1,205,776	1,205,776
Total revenues earned, carried forward	\$34,029,667	22,887,703	56,917,370

STATEMENT OF CURRENT REVENUES, EXPENDITURES, AND APPROPRIATIONS—Continued

Expenditures and Appropriations

	General	Restricted	Total
Total revenues earned, brought forward	\$34,029,667	22,887,703	56,917,370
EDUCATIONAL AND GENERAL:			
Administration	2,122,432		2,122,432
General operations	710,962		710,962
Instruction	10,261,176	216,845	10,478,021
Research programs	115,196	12,612,500	12,727,696
Training programs Special programs		$3,364,659 \ 2,919,523$	3,364,659 $2,919,523$
Libraries	1,411,393	153,674	1,565,067
Physical plant	2,473,705	-	2,473,705
	17,094,864	19,267,201	36,362,065
RELATED ACTIVITIES:			
Duke Hospital	9,605,779	_	9,605,779
Other	270,558		270,558
	9,876,337	_	9,876,337
AUXILIARY ENTERPRISES	5,841,754		5,841,754
STUDENT AID:			
Fellowships and scholarships	1,395,114	1,248,626	2,643,740
Other		142,461	142,461
	1,395,114	1,391,087	2,786,201
. (1.1.)	34,208,069	20,658,288	54,866,357
App (deduct) appropriations and transfers: Current funds—net	(332,924)	332,924	
Student loan funds	64,904	15,149	80,053
Endowment funds	_	90,022	90,022
Plant funds—net	188,375	1,791,320	1,979,695
	34,128,424	22,887,703	57,016,127
Excess of expenditures and appropriations			
over revenues	\$ 98,757	_	98,757

STATEMENT OF CHANGES IN CURRENT FUNDS BALANCES

Year Ended June 30, 1966

			General		
		Unappro- priated	Reserves	Total	Restricted
Balance at June 30, 1965, as previously reported					
(note 11)	\$	101,402	582,455	683,857	14,551,475
Income expendable at June 30, 1965, but restricted as to purpose: Deferred income—The James B.Duke Professorship Fund	ł				
Endowed Special		_	-	_	76,951
Funds Scholarship Funds					266,532 443,569
70		101,402	582,455	683,857	15,338,527
Deduct: Funds for land, buildings, and equipment trans- ferred to unexpended pla funds	nt	_	_		7,180,887
Reclassification of reserves to ther balance sheet accounts—net	0		63,930	63,930	
Balance at July 1, 1965, as adjusted Add (deduct):		101,402	518,525	619,927	8,157,640
Excess of expenditures and appropriations over revenues of current funds Amount transferred from reserve for reappro-	S	(98,757)	_	(98,757)	(1,205,776)
priation for hospital operations Increase in purchase orders and other encumbrances		280,000	(280,000)	_	_
at June 30, 1966 over June 30, 1965 Appropriated from auxiliary enterprises to reserve for		_	_	_	(2,097,569)
married student housing $3-1/2\%$ serial bonds	_		24,110	24,110	_
Balance at June 30, 1966	\$	282,645	262,635	545,280	4,854,295

STATEMENT OF CHANGES IN STUDENT LOAN FUND BALANCES

Year Ended June 30, 1966

Balance at June 30, 1965, as previously reported (note 11))	\$ 869,865
Add U. S. Government provided loan funds at June 30, 1965		1,292,266
Deduct principal not available for loans at June 30, 1965		$2,162,131 \\ 65,152$
Balance at July 1, 1965, as adjusted		2,096,979
ADDITIONS: Endowment income Investment income Interest on notes Gifts—Schedule K Appropriations from U. S. Government Appropriations from current fund: General Restricted	\$ 3,734 10,110 16,928 7,149 587,079 64,904 15,149	705,053
Deductions: Loans cancelled for teaching credits and other reasons Write off of uncollectible notes Transferred to endowment funds	8,172 2,638 9,727	20,537
Balance at June 30, 1966		\$ 2,781,495

STATEMENT OF CHANGES IN PRINCIPAL OF ENDOWMENT FUNDS

Year Ended June 30, 1966

Balance at June 30, 1965, as previously reported (note	11)	\$47,023,605
Add: Fund functioning as endowment Principal of funds with income restricted as to		3,801,625
purpose at June 30, 1965: Endowed special funds Scholarship funds Student loan funds		3,498,426 5,150,659 65,152
Balance at July 1, 1965, as adjusted		59,539,467
Additions: Gifts—Schedule L Net gains on investments Transferred from: Current restricted funds Student loan funds Deductions: Transfer to unexpended plant funds (note 10) Transfer to current general funds (note 10) Other Balance at June 30, 1966	\$ 412,156 1,710,795 90,022 9,727 848,456 353,417 8,610	2,222,700 61,762,167 1,210,483 \$60,551,684
Consisting of: Endowment: General Income restricted for: Student aid Other than student aid Student loans Fund functioning as endowment (note 10)		45,857,081 6,419,321 5,612,073 67,605 2,595,604 \$60,551,684

STATEMENT OF CHANGES IN UNEXPENDED PLANT FUND BALANCES

Year Ended June 30, 1966

Balance at June 30, 1965, as previously reported (note 1 $$	1)	\$ 1,885,336
Add funds for land, buildings, and equipment included in current restricted funds at June 30, 1965		7,180,887
Balance at July 1, 1965, as adjusted		9,066,223
Additions: Gifts—Schedule M Investment income Transferred from endowment funds (note 10) Transferred from auxiliary enterprises (note 3) Received from medical and surgical private diagnostic clinic Appropriations from current funds: General Restricted	\$ 4,423,196 336,495 848,456 396,374 296,840 188,375 1,791,320	8,281,056 17,347,279
Deductions: Capital expenditures Renewals and replacements Other Balance at June 30, 1966 Consisting of funds for: Capital expenditures Renewals and replacements Other	7,984,083 940,425 42,246	8,966,754 \$ 8,380,525 7,509,539 24,135 846,851 \$ 8,380,525

STATEMENT OF CHANGES IN NET INVESTMENT IN PLANT

Year Ended June 30, 1966

Balance at July 1, 1965		\$ 95,818,227
Additions:		057 019
Expended from current general funds Retirement of 3-1/2% serial bonds—current		857,213
general funds		32,500
Expended from current restricted funds Less property purchased under contracts—title	\$ 2,668,275	
vested in grantor—net	513,991	2,154,284
Unexpended plant funds	7,984,083	
Less off campus building constructed with funds received from National Science Foundation—		
title vested in North Carolina State University	193,792	7,790,291
BALANCE at June 30, 1966		\$106,652,515

NOTES TO FINANCIAL STATEMENTS

June 30, 1966

- (1) The accounts do not include as endowment that portion of the indivisible Corpus of The Duke Endowment, the income of which accrues to Duke University subject to the terms of a Trust Indenture dated December 11, 1924, whereby Mr. James B. Duke established a trust to be administered for educational and charitable purposes.
- (2) Staff benefits included in current expenditures during the year were as follows:

Educational and general	\$1,880,197
Related activities	539,685
Auxiliary enterprises	160,149
Student aid	3,360
	\$2,583,391

- (3) Land, buildings, equipment, and library books are stated in the balance sheet at amounts shown on the books substantially at cost of original assets acquired. In accordance with generally accepted institutional accounting practices, depreciation on buildings and equipment is not reflected in the accompanying financial statements, and assets discarded are removed from the plant accounts only when it is practicable to determine original cost. Further, provisions for replacement of certain dormitory and other auxiliary service facilities have been charged to auxiliary enterprises and are funded by transfers of pooled cash to unexpended plant funds.
- (4) A summary of the investments in the several funds at June 30, 1966, in comparison with quoted market value, is as follows:

	Cost or	Quoted
	Amortized	Market
Current funds:	Value	Value
General (pooled cash and securities)	\$ 5,349,224	5,324,355
Restricted	4,648,107	5,420,516
Student loan funds	87,376	121,392
Endowment funds	60,466,173	87,504,926
Plant funds	9,015,534	9,115,184
Agency funds	464,824	493,058
	\$80,031,238	107,979,431

(5) The 3½% Serial Bonds, which are payable in annual installments of \$35,000 with increasing annual amounts to the year 2001, are secured by a first mortgage on an apartment facility (carried at a cost of approximately \$2,650,000) for married students and a first lien on and pledge of the net revenues to be derived from the operation of the facility. Further, under the terms of the loan agreement, the University has deposited, with the Trustee, \$245,000 principal amount of U. S. Treasury Bonds to secure the payment of principal and interest. The outstanding amount of indebted-

Notes to Financial Statements-Continued

ness at June 30, 1966, is after deducting a payment of \$17,500 to the Trustee in February, 1966.

(6) A summary of the notes payable at June 30, 1966, is as follows:

Description Secured:	Interest Rate	Balance
Payable in annual installments of \$144,184 and secured by a deed of trust on land carried at a cost of \$901,160	41/2%	\$ 720,920
Unsecured: Payable in annual installments of \$60,000 beginning March 1, 1967, after payment of \$40,000 in January, 1967		640,000
Payable on April 1, 1971	51/2%	325,000 \$1,685,920

The $5\frac{1}{2}\frac{9}{0}$ notes were issued in connection with the cost of a group of apartment buildings purchased during the year.

In April, 1966, an art collection was purchased at a cost of \$900,000 of which \$260,000 was paid in cash and a \$640,000 non-interest bearing note was issued in payment of the balance; under certain conditions, the terms of the agreement provided for adjustment of the annual payment.

- (7) The University has under construction two dormitories for men students which are estimated to cost approximately \$4,230,000. A loan agreement has been executed providing for sale to the Community Facilities Administration of \$2,934,000 of 35/8% Serial Bonds dated March 1, 1965, payable in annual installments of \$40,000 commencing in 1968 with increasing annual amounts to the year 2005. Temporary financing has been obtained from Endowment Funds and the bonds were issued on July 15, 1966.
- (8) Open contracts for construction of buildings and equipment amounted to approximately \$16,000,000 at June 30, 1966.
- (9) Current restricted fund balances at June 30, 1966, are after deducting deficits aggregating \$1,353,079 which have arisen from expenditures in excess of funds received for restricted purposes. Included in these deficits are amounts aggregating \$1,124,430 for expenditures on government contracts and grants for research, etc. These deficits will be recovered in future years, principally from Federal and State Government appropriations and outside gifts.

Plant fund balances—net at June 30, 1966, are after deducting deficits of \$3,217,047 which have arisen from expenditures in excess of funds re-

Notes to Financial Statements-Continued

ceived for several facility projects. These deficits will be recovered in future years from outside gifts, transfers from current funds, and the proceeds received from the 35/8% Serial Bonds (see note 7).

- (10) The balance (\$2,595,604) of fund functioning as endowment at June 30, 1966, which is included in endowment funds, will be used during the year ending June 30, 1967 to purchase land, buildings, and equipment. During the year transfers were made from fund functioning as endowment: \$848,456 to plant funds and \$353,417 to current general funds. The transfer to current general funds is included in revenue from related activities—Duke Hospital to cover the unabsorbed deficit to June 30, 1960 from hospital operations which, at June 30, 1965, was reflected in the accounts as a reduction of unappropriated current general fund balance.
- (11) During the year the University substantially adopted the generally accepted reporting format as set forth in "Volume 1—College and University Business Administration" (American Council on Education), the authoritative literature on this subject in the educational field and, in connection therewith, made adjustments to its accounts consisting primarily of restatement of various fund balances by reclassifications. This change had no material effect on the overall financial position or the excess of current fund expenditures and appropriations over revenues for the current year in comparison with the preceding year.

SCHEDULE A-ENDOWMENT FUNDS

BOOK VALUE

0-					1
Ge	n	e	r	\mathbf{a}	1:

WILLIAM B. BELL ENDOWMENT FUND

Established 1951 by bequest from William B. Bell; to be added to the general endowment of the University.

52,525.65

CENTENNIAL ENDOWMENT FUND

Gifts from a number of individuals in connection with the Centennial celebration of Duke University; the income to be used annually, in the judgment of the Trustees, for the benefit of the University.

89,407.25

JOSEPH COHAN ENDOWMENT FUND

Established 1959 by bequest from Joseph Cohan; to be added to the general endowment of the University.

45,237.08

ANGIER BUCHANAN DUKE ENDOWMENT FUND

Established 1923 by bequest of Angier Buchanan Duke, '05; to be added to the general endowment of the University.

614,351.66

B. N. DUKE ENDOWMENT FUND

Established 1913 by gift from Benjamin Newton Duke; to be added to the general endowment of the University.

1,110,606.07

DORIS DUKE ENDOWMENT FUND

Established 1955 by gift from Doris Duke and allocated by the Trustees for permanent endowment.

473,921.42

J. B. DUKE ENDOWMENT FUND

Established 1913 by gift from James Buchanan Duke; to be added to the general endowment of the University.

3,667,352.27

SARAH P. DUKE BEQUEST TO THE B. N. DUKE ENDOWMENT FUND

Established 1939 by bequest from Mrs. Sarah Pearson Duke; onehalf of the net income to be used for the general purposes of the University; and one-half of the net income to be used for the establishment of the B. N. Duke Scholarships.

1,162,936.94

WASHINGTON DUKE ENDOWMENT FUND

Established 1897 by gift from Washington Duke; to be added to the general endowment of the University.

318,823.46

DUKE UNIVERSITY ENDOWMENT FUND

Established 1956 from gifts and grants which had been temporarily carried as funds functioning as endowment.

21.608,326.61

C. C. DULA ENDOWMENT FUND

Established 1927 by gift from Caleb C. Dula; to be added to the general endowment of the University.

494,379,48

364,879.77

Schedule A (Continued)-Endowment Funds

BOOK VALUE ROBERT L. FLOWERS ENDOWMENT FUND Established 1952 by bequest from Robert L. Flowers, '04; to be added to the general endowment of the University. \$ 321,124.36 FORD FOUNDATION ENDOWMENT FUND Established 1956 by gift from The Ford Foundation; to be used to advance the academic program either by increases in faculty salaries or by meeting other pressing academic needs. 3,854,625.52 FORD MEDICAL SCHOOL ENDOWMENT FUND Established 1956 by gift from The Ford Foundation; the income to be used for current instructional uses of the medical school. 3,525,371.56 GENERAL EDUCATION BOARD ENDOWMENT FUND Established 1923 by gift from the General Education Board; to be added to the general endowment of the University. 723,711.72 GENERAL ENDOWMENT FUND Established to accumulate sundry endowment gifts; from various individuals, foundations and corporations. 1,096,714.42 GRADUATE SCHOOL ENDOWMENT FUND Established to consolidate the Development of Graduate School Endowments; consisting of gifts by General Education Board, The Duke Endowment, and other Miscellaneous donors in 1950, 1951, and 1952 in connection with the Development Campaign. 4,144,554.82 ELIZABETH P. HANES ENDOWMENT FUND Established 1952, being the unexpended portion of gift from Elizabeth P. Hanes, '08, for construction of a Nurses' Home; this residue being added to the general endowment. 593,872.27 WALKER P. INMAN ENDOWMENT FUND Established 1951 by gifts from Walker P. Inman; to be added to the general endowment of the University. 186,971.19 FLORENCE REYNAUD MCALISTER CHAIR OF MEDICINE AND MEDICAL RESEARCH Established 1936 by gift from Mrs. Amelie McAlister Upshur; as a memorial to her sister. 491,497.91 DAVID OVENS ENDOWMENT FUND Established 1950 by gift from David Ovens; to be added to the 122,013.38 general endowment of the University. W. R. PERKINS ENDOWMENT FUND Established 1945 by bequest from William R. Perkins; to be added

to the general endowment of the University.

BOOK VALUE

WILLIAM NEAL REYNOLDS ENDOWMENT FUND

Established 1950 by gift from William N. Reynolds, '86; to be added to the general endowment of the University.

517,484.16

LUTHER P. TAPP MEMORIAL ENDOWMENT FUND

Established 1951 by gift from Mr. and Mrs. L. B. Jenkins, '10, and supplemented subsequently by additional gifts in memory of her father, Luther P. Tapp; the income to be used to supplement salaries of professors in the general field of the Humanities.

103.871.12

WORD H. WOOD ENDOWMENT FUND

Established 1963 by bequest from Word H. Wood; to be added to the general endowment of the University.

172,521.04

45,857,081.13

Income Restricted for Student Aid:

MARTHA LIPSCOMB ADAMS SCHOLARSHIP FUND

Established 1964 by gift of John Q. Adams and supplemented by additional gifts in memory of Martha Lipscomb Adams, '29; the income to be used for scholarship aid to worthy students of the Woman's College of Duke University.

3,883.16

FRED SOULE ALDRIDGE—DURHAM COUNTY ALUMNI SCHOLARSHIP FUND

Established December, 1947 by gift of Fred S. Aldridge, '96, and Mrs. Aldridge and includes subsequent contributions from the Durham County Alumni; the income to be used for scholarship aid, preference to be given to young men from Durham County.

7,319.52

GEORGE G. ALLEN SCHOLARSHIP FUND

Established July, 1947 by gift of George G. Allen; the income to be used for scholarship aid to deserving boys and girls from Warren County, N.C., and, under certain conditions, for other worthy students.

155,379.47

GEORGE V. ALLEN FUND

Established December, 1965 by gift from Mr. George V. Allen; the income to be used for the support of a chair in International Relations.

25,911.09

ALUMNAE SCHOLARSHIP FUND

Established May, 1940 by the Alumnae Association, in connection with the celebration of the Centennial of Duke University; the income to be used for scholarship aid to young women students of the Woman's College.

5.384.09

BOOK VALUE

ALUMNI MEMORIAL SCHOLARSHIP FUND

Established December, 1943 by gifts from Mr. George M. Ivey, '20 and Mr. Hunter Jones, '19 in memory of alumni of Duke University who lost their lives during World War II; the income to be used for scholarship aid to worthy students.

-2.444.10

R. ERNEST ATKINSON SCHOLARSHIP FUND

Established August, 1952 by bequest of the Reverend R. Ernest Atkinson, '17; the income to be used for scholarship aid to needy young Methodist ministers while studying at Duke University.

495.54

ATLANTA ALUMNI SCHOLARSHIP FUND

Established May, 1941 by gifts of members of the Alumni Association of Atlanta, Ga.; the income to be used for scholarship aid to worthy students.

7,402.83

ALICE M. BALDWIN SCHOLARSHIP FUND

Established June, 1945 and supplemented from time to time by gifts from students and alumnae in honor of Alice M. Baldwin, Dean of the Woman's College, 1923-47; supplemented by a gift from the Class of 1951 of the Woman's College in memory of Bernice Lipscomb, '51, and Betsy Thorup, '51; and supplemented in 1958 by a gift from the Class of 1942 of the Woman's College; to be used for scholarship aid to undergraduate students in the Woman's College.

79,387.75

BANKS-BRADSHAW SCHOLARSHIP FUND

Established 1913 by gift of W. L. Banks and Mike Bradshaw, '78; the income to be used for scholarship aid to worthy students.

3,260.60

EVELYN BARNES MEMORIAL SCHOLARSHIP FUND

Established in 1953 in memory of Evelyn Barnes; the income to be used for scholarship aid to worthy students in the Woman's College.

12.010.86

ROBERT SPENCER BELL STUDENT AID FUND

Established 1942 by James A. Bell, '86, of Charlotte, N. C., in memory of his son, Robert Spencer Bell, and supplemented subsequently by additional gifts; the income to be used in providing annually a prize for one or more students evidencing the greatest improvement in his college work during the year.

45,715.00

GERMAIN BERNARD FUND

Established 1959 by gift from B. C. Remedy Company and transferred in 1961 from Current Restricted Fund; the income to be used by the Duke University Medical School for scholarships, loans or research and if not used for these purposes, to be paid to the Duke University Medical Support fund as a part of the Loyalty Fund.

7,074.64

	BOOK VALUE
Herbert J. Bass Scholarship Fund Established 1900 by gift of Mr. and Mrs. Herbert J. Bass of Durham, N. C., in memory of their son, Herbert J. Bass, Jr.; the income to be used for scholarship aid to worthy students.	\$ 3,272.77
WILLIAM M. BLACKBURN SCHOLARSHIP FUND Established 1962 by various contributions; the income to be used for scholarship aid to worthy students.	5,493.12
THOMAS C. BOST FOUNDATION Established December 17, 1965 by gift from Dr. Thomas C. Bost; the income to be used to encourage and promote scientific study and research in medicine and medical education, particularly of a surgical nature, to dissiminate the results of such study and research by lectures and publications, and to provide loans, scholarships, fellowships, and grants to students enrolled in Duke University School of Medicine.	39,410.45
EDGAR S. BOWLING SCHOLARSHIP FUND Established 1928 by gift of Edgar S. Bowling, '99, in memory of his sister, Mrs. Maye Bowling Bennett, '12; the income to be used for scholarship aid, preference to be given to boys and girls from Durham and adjoining counties.	
Franklin Brown Family Scholarship Fund Established 1954 by gift from Mr. W. Franklin Brown, '37, and Mrs. Louise Jones Brown, '38; the income to be used for scholarship aid to worthy undergraduate students.	16,214.54
ELIZABETH CROWELL CARNES FOUNDATION SCHOLARSHIP FUND Established January, 1948 by bequest of Elizabeth Crowell Carnes, in memory of her parents, Jonas William Crowell and Virginia Vick Crowell; the income to be used for scholarship aid for young men and women of Duke University.	
CENTENNIAL SCHOLARSHIP FUND Established 1939 by gifts from several donors in connection with the Centennial celebration of Duke University; the income to be used for scholarship aid to worthy students.	3,181.97
ROBERT L. CHAMBERS MEMORIAL SCHOLARSHIP FUND Established 1965 by various contributors in memory of Robert L. Chambers, former head trainer and track coach at Duke University; the income to be used for scholarship aid to deserving and aspiring Duke University track team members.	7,843.84

BOOK VALUE CHRISTIAN EDUCATION SCHOLARSHIP FUND Established by various contributions designated for scholarships in the Christian Education Movement, and includes contributions from Julian S. Carr, Mrs. Annie A. Foushee, C. T. Johnson, H. E. Myers, the Pegram Family, W. P. Suggs, E. T. White, Mr. and Mrs. J. C. Braswell and Mrs. R. C. Bruton, in memory of Alexander Walker, the alumni of Harnett County, and others; the income to be used for scholarship aid to worthy students. \$ 13,408.05 CLARK CLASSICAL PRIZE FUND Established 1956 by bequest from David Taggart Clark; the income to be used for the award of an annual prize for Greek or Latin declaration or recitation. 274.40 CLASS OF 1906 SCHOLARSHIP FUND Established July, 1937 by gifts from several members of the Class of 1906; the income to be used for scholarship aid to worthy students. 1,958.01 CLASS OF 1910 SCHOLARSHIP FUND Established June 5, 1960 by several members of the Class of 1910; the income to be used for scholarship aid to worthy students. 875.23 CLASS OF 1912 SCHOLARSHIP FUND Established by gifts from several members of the Class of 1912; the income to be used for scholarship aid to worthy students. 1.270.72 CLASS OF 1914 SCHOLARSHIP FUND Established December, 1938 during the Centennial celebration of Duke University by various members of the Class; the income to be used for scholarship aid to worthy students, preference to be shown to descendants of the members of the Class of 1914. 6,187.81 CLASS OF 1917 SCHOLARSHIP FUND Established July, 1944 by gifts from Mr. and Mrs. C. S. Bunn and supplemented by gifts from several members of the Class of 1917; the income to be used for scholarship aid to worthy students. 3,593.14 CLASS OF 1918 SCHOLARSHIP FUND Established by gifts from several members of the Class of 1918; the income to be used for scholarship aid to worthy students. 754.65

THE CLELAND SCHOLARSHIP FUND

Established 1963 by gift of James T. and Alice Mead Cleland; the income to be used for scholarship aid to a designated senior Divinity student.

14,498.47

BOOK VALUE

E. M. COLE FOUNDATION FUND

Established 1920 by E. M. Cole, Charlotte, N. C.; the income to be used for scholarships for the benefit of students preparing for the ministry.

26.078.98

C. T. COUNCIL FUND

Established 1959 by a gift from the B. C. Remedy Company and transferred from Current Restricted Fund in 1961; the income to be used by the Duke University Medical School for scholarships, loans or research, and if not used for these purposes, to be paid to the Duke University Medical Support Fund as a part of the Loyalty Fund.

6.727.82

ROBERT B. COX SCHOLARSHIP FUND

Established 1949 by gift of Robert L. Wolf, '50, and supplemented from time to time by other gifts; the income to be used for scholarship aid for undergraduate men.

10,987.37

WILL L. CUNINGGIM SCHOLARSHIP FUND

Established 1934 by bequest of Mrs. W. L. Cuninggim, and supplemented by bequest of Mrs. Albert Bourne, in memory of Reverend Will L. Cuninggim, '77; the income to be used for scholarship aid, preference being given to graduates of the Methodist Orphanage, Raleigh, N. C.

18,860.85

JULIA DALE MEMORIAL FUND

Contributions by friends and relatives in memory of Miss Julia Dale; the income to be used to provide annually for the Julia Dale Prize in Mathematics.

2,387.56

ROSE M. DAVIS SCHOLARSHIP FUND

Established 1941 by Dr. Rose M. Davis, '16; the income to be used for scholarship aid.

503.03

JERE R. DOWNING SCHOLARSHIP FUND

Established 1936 by Mrs. Alice M. Downing and her son, J. Robert Downing, '35, as a memorial to their husband and father, Jere R. Downing of Kennebunk, Me.; the income to be used for scholarship aid, preference to be given to students from New England.

2,641.03

JAMES B. DUKE 100TH ANNIVERSARY FUND

Established in 1956 by gift from The Duke Endowment, in recognition and commemoration of the one hundredth anniversary of the birth of James B. Duke; for the purpose of attracting and/or developing outstanding scholars in and through the Graduate School of Arts and Sciences at Duke University.

1,909,107.13

91,933.52

Schedule A (Continued)-Endowment Funds

BOOK VALUE DUKE PI TAU SIGMA AWARD FUND Established 1956 by gift from The Duke Pi Iota Chapter of Pi Tau Sigma; the income to be used for an annual award to the mechanical engineering senior student who has presented the most outstanding paper in class work or in professional society competition. 7.264.57 N. EDWARD EDGERTON SCHOLARSHIP IN RELIGION FUND Established May, 1940 by gift of N. Edward Edgerton, '21, of Raleigh, N. C.; to be used only for scholarship aid to candidates for the B.D. Degree in the Divinity School of Duke University. 14,987.46 N. E. EDGERTON SCHOLARSHIP FUND Established in January, 1953 by N. E. Edgerton, '21, through the Duke University Development Campaign; the income to be used for scholarship aid to worthy students, preference to be given to students from Wake County, North Carolina. 20,165.09 THE FRANK L. ENGEL MEMORIAL FUND Established 1963 by various contributions through the Duke University Medical Center; the income to be used for an award to an outstanding medical undergraduate at Duke University to participate in the research and clinical activities of the Division of Endocrinology. 2,899.55 ENGINEERING SCHOLARSHIP FUND Established by gifts of various persons; to be used for scholarship aid to engineering students. 390.19 WILLIAM P. FEW MEMORIAL SCHOLARSHIP FUND Established 1942 by gifts from various persons and supplemented from time to time by other gifts; to be used for scholarship aid to worthy students. 11,334.00 ANNE FLEXNER MEMORIAL FUND Established October, 1947 by Dr. Morris Flexner and Mrs. Marion W. Flexner, in memory of their daughter, Anne Flexner, '45; the income to be used for an annual award to the student who does the most outstanding piece of creative writing. 3,603.41 ARTHUR ELLIS FLOWERS SCHOLARSHIP FUND Established 1901 by Col. and Mrs. George W. Flowers, in memory of their son, Arthur Ellis Flowers; the income to be used for scholarship aid to worthy students. 2,515.02 FRED FLOWERS SCHOLARSHIP FUND

Established 1961 by bequest of Mr. Fred Flowers, '08; the income

to be used for scholarship aid for worthy students.

	BOOK VALUE
GEORGE W. FLOWERS SCHOLARSHIP FUND Established June, 1927 by Claude M. Flowers, '09, in memory of his father, Col. Geo. W. Flowers, for many years a Trustee of Trinity College; the income to be used for scholarship aid to needy and worthy students.	
R. L. FLOWERS TRUST SCHOLARSHIP FUND Established 1948 by bequest of Lily Parrish Flowers; the income to be used for scholarship aid for worthy students.	128,942.01
Sara Clarkson Fowler Scholarship Fund Established 1963 by gift from Henry B. Fowler, in memory of Sara Clarkson Fowler; the income to be used for scholarship aid to worthy students.	
WILLIAM F. FRANCK MEMORIAL FUND Established 1958 by gift from William F. Franck, Jr., '39, supplemented by additional gifts; the income to be used for cardiac research, or medical school scholarships, and if not used for these purposes, to be paid to the Loyalty Fund.	
GIBBONS MENTAL HEALTH FUND Established 1963 by bequest from John P. Gibbons; to be used to establish a J. P. Gibbons Professorship of Psychiatry.	
OTTIS GREEN FOUNDATION SCHOLARSHIP FUND Established 1951 by gift from Ottis Green, '97, and supplemented from time to time by other gifts; the income to be used to provide scholarships and fellowships for advanced study in the Graduate School of Duke University.	:
GUILFORD COUNTY SCHOLARSHIP FUND Established 1941 by miscellaneous gifts of several persons; the income to be used for scholarship aid to worthy students.	279.13
A. H. Gwyn Scholarship Fund Established May, 1951 by Judge A. H. Gwyn, '18; the income to be used for scholarship aid to worthy students.	3,000.76
E. BAYARD HALSTED SCHOLARSHIP IN MEDICINE FUND Established 1961 by bequest of Mr. E. Bayard Halsted; the income to be used to enable a graduate of the Duke Medical School to pursue advanced studies in some branch of Medical Science.	
E. BAYARD HALSTED SCHOLARSHIPS IN SCIENCE, HISTORY AND JOURNALISM FUND Established 1961 by bequest of Mr. E. Bayard Halsted; the income	2
to be used to enable a graduate of Duke University to pursue advanced studies in some branch of Science, History or Journalism.	88,208.26

8.523.97

Schedule A (Continued)—Endowment Funds

BOOK VALUE CHARLES W. HARGITT RESEARCH FELLOWSHIP IN ZOOLOGY FUND Established 1939 by Dr. George T. Hargitt; the proceeds to be used for establishing a research fellowship in Zoology, to be named in memory of Charles W. Hargitt. 149,276.94 I. WELCH HARRISS SCHOLARSHIP FUND Established May 23, 1950 by gift of J. Welch Harriss, '27, and supplemented subsequently by additional gifts; the income to be used for scholarships to deserving young men from High Point, N. C., entering the Freshman Class. 65.135.70 B. D. HEATH SCHOLARSHIP FUND Established 1903 by B. D. Heath; to be used for scholarship aid to worthy students from Union County, N. C. 6,035.23 HIGH POINT SCHOLARSHIP FUND Established by gifts of members of the High Point Alumni Association in connection with the celebration of the Centennial of Duke University; the income to be used for scholarship aid for students who are graduates of the High Point, N. C., High School. 12,464.67 HOLCOMB SCHOLARSHIP FUND Established 1956 by gift from Dent Z. and Helen Holcomb; income to be used for scholarship aid to worthy students. 13,074.93 WINFRED QUINTON HOLTON MEMORIAL FUND Established 1922 by gifts of Holland Holton, '07, and Mrs. Lela Young Holton, '07, in memory of their son, Winfred Quinton Holton; the income to be used to provide a prize for investigative work in primary education. 2.243.88 GEORGE M. IVEY SCHOLARSHIP FUND Established December 8, 1948 by gift of George M. Ivey, '20; the income to be used for scholarship aid for deserving students in the Divinity School. 26,258.18 WILLIAM PATTERSON JOHNSTON SCHOLARSHIP FUND Established 1964 by gift from Mr. Kenneth Taylor, '51, other employees of Old Dominion Candies, Incorporated, and supplemented by an additional gift from Mrs. William Patterson Johnston; the income to be used for scholarship aid to worthy students. 2.155.34 HUNTER JONES SCHOLARSHIP FUND Established December, 1947 by gift of Hunter Jones, '19, Durham, N. C.; the income therefrom to be used for scholarship aid to

worthy students.

BOOK VALUE

HENRY HARRISON JORDAN MEMORIAL SCHOLARSHIP FUND

Established December, 1938 by gifts from Mrs. George Way, B. Everett Jordan, '18, H. W. Jordan, Charles E. Jordan, '23, Mrs. H. C. Sprinkle, Jr., '24, and Frank B. Jordan, '27, in memory of their father, Reverend Henry Harrison Jordan, a member of the Western North Carolina Conference, and supplemented subsequently by additional gifts; the income to be used for scholarship aid to worthy students.

43,003.50

I. M. JUDD SCHOLARSHIP FUND

Established 1922 by Dr. J. M. Judd, '95, of Varina, N. C., with directions that the earnings be allowed to accumulate until such time as they are sufficient to provide a four-year tuition scholarship.

2.515.02

GURNEY HARRISS KEARNS FOUNDATION FOR GRADUATE STUDY IN RELIGION FUND

Established 1935 by gifts of Mr. and Mrs. Gurney Harriss Kearns, '97, High Point, N. C., supplemented by Amos R. Kearns, '27, and Charles L. Kearns, '32, and Katherine Kearns Cheek; the income to be used to promote advanced graduate study and research in religion primarily through the award of fellowships, but also to secure visting lecturers and seminar leaders, and to award grants-in-aid to publish the more significant fruits of scholarly research in religion.

219,959.01

LEWIS CLARENCE KERNER SCHOLARSHIP IN RELIGION FUND

Established in May, 1959 by gift of Mrs. Beatrice Kerner Reavis in memory of her brother, Lewis Clarence Kerner; the income to be used for scholarship aid to worthy students of the Divinity School.

24,722.97

FRANK S. LAMBETH SCHOLARSHIP FUND

Established 1930 by bequest of Col. Frank S. Lambeth, '80; the income to be used for scholarship aid to worthy students of Duke University.

2.544.98

LAURINBURG CHRISTIAN EDUCATION SCHOLARSHIP FUND

Established December 11, 1948 by gift through the Methodist College Advance Fund; the income to be used for scholarship aid for worthy students of the Divinity School.

12.215.22

WILLIAM S. LEE MEMORIAL SCHOLARSHIP FUND

Established 1957 by gift from Mrs. W. S. Lee in memory of her late husband; the income to be used for scholarship aid for undergraduates in the Woman's College at Duke University.

38,932,21

BOOK VALUE

WILLIAM A. LEGGETT SCHOLARSHIP FUND

Established in 1961 by gift of Leggett Memorial Fund; the income to be used for Nursing School Scholarships. If not used for this purpose, income to be transferred annually to the Duke University Loyalty Fund.

1,970.00

D. M. LITAKER SCHOLARSHIP FUND

Established 1946 by gift of Charles H. Litaker, '28, in memory of his father, Dr. D. M. Litaker, '90, who for 47 years was an active minister in the Methodist Church, and supplemented subsequently by additional gifts; the income and, under certain conditions, a part of the corpus of the fund to be used for scholarship aid for undergraduate students, natives of the territory now embraced by the Western North Carolina Conference who are preparing for the ministry.

48,423,70

MARY ELIZABETH DUKE LYON SCHOLARSHIP FUND

Established 1942 by Mrs. Mary Washington Stagg in memory of her mother, Mary Elizabeth Duke Lyon; the income to be used for scholarship aid for worthy students.

12,635.53

THE MCALISTER SCHOLARSHIP FUND

Established December, 1935 by Mrs. Amelie McAlister Upshur in memory of her mother, Armantine Reynaud McAlister, and father, William Henry McAlister; the income to be used annually for a scholarship for one boy and one girl from each of the three states of North Carolina, South Carolina and Louisiana.

251,638.35

J. H. McCracken Memorial Scholarship Fund

Established 1947 by Dr. J. H. McCracken, '22, and contributions from members of the First Methodist Church of Henderson, N. C., in memory of Reverend J. H. McCracken, '92, for many years a member of the North Carolina Conference; income to be used for scholarship aid.

11,589.71

T. W. McCracken Scholarship Fund

Established 1945 by Thomas W. McCracken, '15; the income to be used for scholarship aid for worthy students.

12,044.78

THE O. G. B. McMullan Scholarship Fund

Established 1913 by gift of O. G. B. McMullan of Elizabeth City, N. C.; the income to be used for scholarship aid for worthy students, preference to be given to residents of Perquimans and Pasquotank Counties, N. C.

3,260.61

BOOK VALUE

TED MANN, JR. MEMORIAL SCHOLARSHIP FUND

Established 1964 by various contributors in memory of Ted Mann, Jr., '65; the income to be used for scholarship aid to athletes on the various intercollegiate athletic teams at Duke University. \$

10,501.07

THE LOUISE AND C. K. MASSEY SCHOLARSHIP FUND

Established 1953 by gift from C. Knox Massey and supplemented subsequently by additional gifts; to be used for scholarship aid to worthy students.

5,817.94

R. A. MAYER SCHOLARSHIP FUND

Established 1939, in connection with the Centennial celebration of Duke University, by gift of R. A. Mayer, '96, in memory of his father, Minor C. Mayer, and mother, Sarah R. Mayer, and supplemented subsequently by additional gifts; the income to be used for scholarship aid for worthy students, preference to be given to students from Mecklenburg County, N. C.

42,809.10

METHODIST COLLEGE ADVANCE FUND

Established by contributions from the Western North Carolina Conference and the North Carolina Conference of the Methodist Church; the income to be used for scholarships for young men and women preparing for full time service in the work of religious education, and for a program of educational service to ministers already in the field. This plan would permit the use of the funds for special conferences, expansion of the Ministers' Loan Library, short-term winter courses, and other services, particularly to rural churches.

33,266.99

ALBERT MILMOW PRIZE IN ELECTRICAL ENGINEERING

Established 1935 by gift of Albert Milmow; the income to be used in providing annually a prize to that student from North or South Carolina graduating in the Department of Electrical Engineering who, in the opinion of the faculty of that department, has made the most progress in electrical engineering during his last year in college. This prize consists of a certificate of award and one year's dues in the American Institute of Electrical Engineers.

376.93

W. H. MOORE SCHOLARSHIP FUND

Established 1920 in memory of Dr. W. H. Moore, '71, by his wife, Mrs. W. H. Moore, and daughters, Mrs. W. E. Steele, Miss Maude Moore, Mrs. T. L. Parsons, Mrs. J. H. Ihrie, and Mrs. J. LeGrand Everett; the income to be used for scholarship aid to worthy students.

3.017.23

14.699.58

25,147.02

Schedule A (Continued)—Endowment Funds

BOOK VALUE THOMAS R. MULLEN, JR. SCHOLARSHIP FUND Established April 5, 1949 by gift of T. R. Mullen in memory of his son and supplemented subsequently by additional gifts; the income to be used for scholarship aid for worthy young men and women. \$ 83,915.22 MYERS PARK SCHOLARSHIP FUND Established 1948 by contributions of the members of the congregation of the Myers Park Methodist Church, Charlotte, N. C.; the income to be used for the benefit of the Divinity School. 21,716.94 GEORGE E. NORMAN, JR. SCHOLARSHIP FUND Established 1963 by gift of George E. Norman, Jr. in memory of the deceased members of his family and supplemented by the Burlington Industries Foundation; the income to be used to assist worthy and deserving young men enrolled in the Department of Religion in the Graduate School of Arts and Sciences or in the graduate department of the Divinity School, who are preparing to enter the Christian ministry as pastors, teachers or foreign missionaries. 14.586.38 J. A. ODELL SCHOLARSHIP FUND Established 1897 by gift of James A. Odell; the income to be used for scholarship aid to worthy students. 3,260.61 J. M. ODELL SCHOLARSHIP FUND Established 1897 by gift of Captain J. M. Odell; the income to be used for scholarship aid to worthy students. 3,260,61 W. R. ODELL SCHOLARSHIP FUND Established 1940 by gifts from Fred C. Odell, '02, Mrs. Ralph M. Odell, Arthur G. Odell, '06, and supplemented from time to time by others, in memory of William R. Odell, '75, for more than 50 years a member of the Board of Trustees of Duke University; the 24,322.68 income to be used for scholarship aid for worthy students. THE W. R. ODELL DIVINITY SCHOLARSHIP FUND Established June, 1946 by members and friends of the Forest Hills Methodist Church, Concord, N. C., in memory of William R. Odell,

HENRY A. PAGE SCHOLARSHIP FUND

paring for the Methodist ministry.

Established January, 1942 by gift of Henry A. Page, Jr., '07, and Gertrude Wetherill Page, in memory of his father, Henry A. Page, for many years a member of the Board of Trustees of Duke University; the income to be used for scholarship aid to worthy students, preferably those preparing for the study of medicine.

'75; the income to be used for scholarship aid for students pre-

BOOK VALUE EDWARD JAMES PARRISH SCHOLARSHIP FUND Established 1921 by Mrs. Rosa Brown Parrish, in memory of her husband, Edward J. Parrish, '67; the income to be used for scholarship aid to worthy students. 2,515.02 PHYSICAL MEDICINE SCHOLARSHIP FUND Established 1963 by gift from Central Carolina Convalescent Hospital, Inc., Greensboro, N. C.; the income to be used for scholarship aid to medical students and/or post graduate fellows in physical medicine and rehabilitation at Duke University. 38,431.80 MARTIIA GARNER PRICE RESEARCH FELLOWSHIP FUND Established 1964 by gift from the Ralph Price family in memory of Mrs. Martha Garner Price; the income to be used for a research fellowship in the World Rule of Law Center of Duke University. 142,650.00 THE JAMES B. RAST MEMORIAL FUND Established December, 1957 by Mr. and Mrs. W. B. Rast, in memory of their son, James Brailsford Rast, '58; the income to be used for an annual award to the student who demonstrates the greatest achievement in the study of Comparative Anatomy. 2,762.96 W. N. REYNOLDS MEMORIAL SCHOLARSHIP FUND Established 1961 by transfer from the W. N. Reynolds Loan Fund; the income to provide scholarships, to be awarded in the following order of preference, children of employees of R. J. Reynolds Tobacco Company, children of residents of Forsyth County, and residents of or natives of North Carolina. 612,403.88 JOHN T. RING SCHOLARSHIP FUND Established 1919 by gift of S. G. Ring and family of Kernersville, N. C., in memory of John T. Ring, '16, who was killed in France during World War I; the income to be used for scholarship aid for worthy students. 3.017.23 T. V. ROCHELLE SCHOLARSHIP FUND Established 1945 by T. V. Rochelle, '14, High Point, N. C.; the income to be used for scholarship aid for a worthy and needy student who is a graduate of the High Point, N. C., High School 12,013.36 GILBERT T. ROWE MEMORIAL SCHOLARSHIP FUND Established 1960 and supplemented from time to time by gifts from friends and alumni in memory of Professor Gilbert T. Rowe, '95, and by combining in 1963 the Winston-Salem District of Western N. C. Conference Loan Fund; the income to be used for scholarship

25,385.80

aid to senior students of the Divinity School.

BOOK VALUE

S.S.
11.
12.
12.161.76

f.S.

ELBERT RUSSELL DIVINITY SCHOOL SCHOLARSHIP FUND

Established 1943 and supplemented from time to time by gifts from friends and alumni of the Divinity School, in honor of Elbert Russell, Dean and Professor of Biblical Interpretation of the Divinity School, 1926-1945; the income to be used for scholarship aid for students preparing for the ministry in the Divinity School. \$

SANDALS SCHOLARSHIP FUND

Established 1955 by contribution from Sandals, for the purpose of providing scholarship awards to rising sophomores in the Woman's College of Duke University.

1.545.99

ALEX. H. SANDS, JR. SCHOLARSHIP FUND

Established 1956 by gifts from Alex. H. Sands, Jr.; to be used for scholarship aid to worthy students.

10.581.28

MARIAN SANFORD SEALY SCHOLARSHIP FUND

Established April, 1966 by transfer from the Marian Sanford Scaly loan fund; the income to be used at the discretion of the Dean of Duke University School of Nursing and a committee appointed by the dean to honor a student enrolled in the Duke University School of Nursing who is worthy of scholarship aid.

3.859.75

WILLIAM SENHAUSER MEMORIAL FUND

Established 1947 by gift of Mrs. Thomas E. Raymond in memory of her son. An award is made annually to the sophomore or junior who has made the greatest contribution through participation and leadership in intramural sports.

2,768.40

JOSEPH H. SEPARK MEMORIAL SCHOLARSHIP FUND

Established 1950 by gifts from friends in memory of Joseph H. Separk, '96, for many years a member of the Board of Trustees of Duke University; the income to be used for scholarship aid to worthy students, preference to be given to students from Gaston County, N. C.

29,658.87

The George Sherrerd, III Memorial Award in Electrical Engineering Established 1958 by gift from Mr. and Mrs. S. Donald Sherrerd, in memory of their son, George Sherrerd, III, '55; the income to be used for an annual award to the senior in Electrical Engineering who has attained the highest level of scholastic achievement in all subjects and simultaneously has rendered significant service to the College of Engineering and the University at large.

11,573.18

J. BUREN SIDBURY CHAIR IN PEDIATRICS

Established 1965 by gift from Dr. J. Buren Sidbury, '08; the income to be used for supporting the activities of a Chair in Pediatrics at the Duke University Medical School.

253,819.93

BOOK VALUE J. RAYMOND SMITH SCHOLARSHIP FUND Established 1939 by J. Raymond Smith, '17, Mt. Airy, N. C., in connection with the Centennial celebration of Duke University; the income to be used for scholarship aid to worthy students. 19,902.93 WILLIS SMITH SCHOLARSHIP FUND Established 1939 by Willis Smith, '10, and supplemented from time to time by other gifts; the funds to be used for scholarship purposes. 94.870.89 THE HERSEY E. AND BESSIE SPENCE CHAIR IN CHRISTIAN EDUCATION Established 1963 by bequest from Hersey E., '07, and Bessie Spence, '06; the income to be used to establish a Chair in Christian Education. 34.653.12 HERSEY EVERETT SPENCE SCHOLARSHIP FUND Established December, 1947 by gifts of members of the Methodist Church of Sanford, N. C., through the Methodist College Advance Fund, in honor of Hersey Everett Spence, '07, former pastor of that church and a member of the faculty of the Divinity School of Duke University; the income to be used for scholarship aid to deserving students in the Divinity School. 12,021.58 WARREN C. AND PATTIE LEE STACK SCHOLARSHIP FUND Established 1962 by gift of Warren C. Stack; the income to be used for scholarship aid to worthy students attending the Duke University School of Law. 702.80 FRANCIS HUNTINGTON SWETT MEMORIAL AWARD FUND Established 1951 by gift from Dr. George J. Baylin, '36; the income to provide an annual award to the most valuable basketball player. 1,385.87 THOMASVILLE SCHOLARSHIP FUND Established 1940 by gifts of T. Austin Finch, '09, and J. Walter Lambeth, '16, by contributions made through the Centennial Fund; the income to be used for scholarship aid for worthy students. 3.142.16 MARY NEWBY TOMS SCHOLARSHIP FUND Established 1906 by gift of Clinton W. Toms and supplemented from time to time by additional gifts; in May, 1947, in connection with supplemental gifts to the Fund, it was established as a permanent endowment in memory of his wife, Mary Newby Toms; the income to be used for scholarship aid for worthy students; preference to be given to students from Durham and Perquimans 227,756.28 Counties, N. C.

21.138.61

Schedule A (Continued)—Endowment Funds

BOOK VALUE HORACE TRUMBAUER MEMORIAL FUND Established 1955 by contribution from Mrs. Helena S. Fennessy and supplemented subsequently by additional gifts in memory of her father Horace Trumbauer; the income to be used for scholarship aid to worthy students, preference being given to students majoring in subjects which relate to the practice of Architecture. \$ 38.579.90 THE WAGGONER SCHOLARSHIP FUND Established 1954 by contribution from T. R. Waggoner, '22, and supplemented subsequently by additional gifts in memory of his parents, Thomas Spencer Waggoner and Eva Barnwell Waggoner; the income to be used for scholarship aid for worthy undergraduate students. 8.149.17 GEORGE W. WATTS SCHOLARSHIP FUND Established 1897 by gift of George W. Watts; the income to be used for scholarship aid to worthy students. 3,260.61 WEATHERBY SCHOLARSHIP FUND Established 1912 by C. E. Weatherby, Faison, N. C.; the income to be used for scholarship aid to worthy students. 3,260.61 WEST CAMPUS CHEST SCHOLARSHIP FUND Established 1954 by the male undergraduate students of Duke University and supplemented annually for the purpose of providing scholarship awards to male students in residence in one of the undergraduate colleges. 3.685.13 THE HILLORY M. WILDER SCHOLARSHIP FUND Established 1962 by bequest from Celeste W. Blake and Kenneth M. Blake, in memory of Dr. Hillory M. Wilder; the income to be used for scholarship aid to capable, earnest young men and women of the white race and protestant faith who are residents of North Carolina and in need of financial assistance in the pursuit of study of the medical profession. 172,721.91 FLORENCE K. WILSON SCHOLARSHIP FUND Established 1955 by contribution from students of the School of Nursing, and by combining in 1961 the Duke Nurses Alumnae Association Scholarship and supplemented by gifts from the Wilson

family and friends; the income to be used for scholarships for students in the School of Nursing. If the income from the fund is not used for scholarship purposes for the School of Nursing it

may be transferred to the Loyalty Fund.

BOOK VALUE WOMAN'S COLLEGE INTERNATIONAL STUDENT SCHOLARSHIP FUND Established 1956 by gifts from students of the Woman's College of Duke University; supplemented by a gift from the Class of 1959 of the Woman's College in memory of Barbara Werner; the income to be used for scholarship aid to worthy students from other countries studying at the Woman's College of Duke University. 11,728.55 WOMAN'S PANHELLENIC SCHOLARSHIP FUND Established May 25, 1949 by gift of the Woman's College Panhellenic Association; income to be used for scholarship aid for a rising senior in the Woman's College of Duke University. 5,532.88 B. S. WOMBLE SCHOLARSHIP FUND Established 1961 by gifts from Edith S. Womble, Lila W. Jenkins, '35, William F. Womble, '37, Olivia W. Long, '39, Edith W. Chatham, '40, Calder W. Womble, '43, Ruth W. Lee, '49, and subsequent gift of Mr. B. S. Womble, '04; the income to be used for scholarship aid to worthy students in the Duke University Law School. 38,995.61 KARL E. ZENER MEMORIAL FUND Established 1965 by various contributors, in memory of Dr. Karl E. Zener, Professor of Psychology; the income to be used for an annual award to an undergraduate psychology major at Duke University who has shown outstanding performance in scholarship. 1,737.00 6.419.321.48 Income Restricted for Other than Student Aid: ALUMNI ACTIVITIES FUND Established 1939 by gift of P. Frank Hanes, '11, in connection with the Centennial celebration of Duke University; the income to be used for the support of the activities of the Alumni Office. 6,416.14 AVERA BIBLE FUND Established 1895 by gift of Mrs. L. B. McCullers in memory of her husband, Willis H. Avera; the income to be used for the purchase of books for the Divinity School Library and for the support of the Avera Bible Lectures. 6,438.15 ISAAC ERWIN AVERY FUND Established 1905 from the proceeds of the sale of the publication

of "Idle Comments," a collection of the writings of Isaac Erwin Avery, '94; the income to be used for the purchase of books in the

2,185.82

field of journalism.

	BOOK VALUE
Louis W. Bailey Memorial Fund Established 1958 by gift of A. Purnell Bailey, B.D., '48, in memory of his father, Louis William Bailey; the income to be used for purchasing books for the Divinity School Library.	\$ 412.83
VIRGINIA FLOWERS BAKER PROFESSORSHIP IN ORTHOPAEDIC SURGERY Established April, 1966 by gifts from various donors in memory of Mrs. Virginia Flowers Baker and by transfer from the Virginia Flowers Baker Orthopaedic Loan Fund, the Taylor Foundation Orthopaedic Current Restricted Fund, the Ann Bleck Orthopaedic Loan Fund, the Crippled Childrens' Orthopaedic Current Re-	
stricted Fund, and the Dennis Campbell Andrews Orthopaedic Loan Fund; the income to be used to support a professorship in Orthopaedic Surgery.	44,421.70
JOHN SPENCER BASSETT MEMORIAL FUND Established by miscellaneous gifts in memory of John Spencer Bassett, '88, formerly Professor in Trinity College; the income to	
be used for the purchase of books for the Library.	864.33
Bequest Program Fund Established 1963 to accumulate unrestricted gifts from bequests.	22,446.73
MARY DUKE BIDDLE LIBRARY FUND Established 1951 by gift from Mary Duke Biddle, '07, and supplemented subsequently by additional gifts; the income to be used to maintain and operate the library of Duke University.	618,400.94
EDGAR S. BOWLING MEMORIAL FUND Established 1955 by gift from Mrs. Edgar S. Bowling: the income to be transferred annually to the Duke University Loyalty Fund.	3,958.08
JOSEPH G. BROWN BOOK FUND Established 1921 by gifts of various individuals in honor of Joseph G. Brown, '75, chairman of the Board of Trustees 1917-27; the income to be used for the purchase of books for the Library.	10,686.57
CHRISTIAN EDUCATION FUND Miscellaneous contributions over a period of many years; to be used for various purposes designated by the donors.	4,979.11
CLASS OF 1909 FUND Established by members of the Class of 1909; the income to be used for the purchase of books for the General Library.	2,508.92
MARY ALICE COOK MEMORIAL FUND Established 1956 by gift from Franklin H. Cook, '36, in memory of Mary Alice Rhodes Cook, '36; the income to be transferred annually to the Duke University Loyalty Fund.	822.66

	BOOK VALUE
THE HARVEY B. CRAVEN FUND Established May 9, 1960 by gift of Harvey B. Craven, '96; the income to be transferred annually to the Duke University Loyalty Fund.	\$ 4,402.42
Crowell Science Lecture Fund Established 1921 by contributions from various individuals; the income to be used for annual lectures on scientific subjects.	3,423.15
DISCRETIONARY FUND OF THE DEAN OF THE CHAPEL Established 1956 by gift from Brewster, '32, and Edith Snow, '32; for special activities and services in connection with the work of the Dean of the Chapel.	55,388.91
THE JAMES B. DUKE PROFESSORSHIP FUND Established 1952 by gift from The Duke Endowment; the income to be used for the purpose of attracting and/or developing distinguished or outstanding professors at the University.	2.642,783.52
DUKE MEMORIAL CHAPEL MAINTENANCE FUND Established 1930 by James A. Thomas; the proceeds to be used toward the maintenance of the Duke Memorial Chapel.	2,515.02
DUKE MONUMENT FUND Established to provide for the perpetual maintenance of the statue of Washington Duke.	2,515.02
Eason Presbyterian Student Fund Established 1953 by gift from W. W. Eason; the income to be available for a Presbyterian ministerial student.	203.03
George Washington Flowers Memorial Fund Established 1941 by bequest of William W. Flowers, '94, in memory of his father, George Washington Flowers, and supplemented in 1952 by bequest of Robert L. Flowers, '04; the income to be used for the purchase of manuscripts, books and other printed or photographed materials dealing with the life and thought of the Southern states of the United States of America.	457,630.95
JOHN McTyeire Flowers Lecture Fund Established 1915 by gift of B. N. Duke in memory of John McTyeire Flowers, '00; the income to be used for lectures dealing with the subject of Christian citizenship.	15,087.63
THE FORESTRY ALUMNI ASSOCIATION FUND Established 1962 by gift from Duke University Forestry Alumni Association; the income to be used to purchase books for the F. X. Schumacher Statistical Library or for other purposes of the School	
Schumacher Statistical Library or for other purposes of the School of Forestry, as directed by the Forestry Alumni Association.	588.96

5.177.93

Schedule A (Continued)-Endowment Funds

BOOK VALUE JESSE T. AND LOVIE BROOKS FRIZZELLE MEMORIAL FUND Established 1954 by gift from Mark T. Frizzelle, '03, and supplemented by additional gifts from J. Paul Frizzelle, Sr., '04, Jasper B. Frizzelle, '09, and John L. Frizzelle, Sr., '12; the income to be transferred annually to the Duke University Loyalty Fund. S 24,553.67 WILLIAM FRANCIS GILL MEMORIAL FUND Established 1918 by gifts of several individuals, in memory of William Francis Gill, '94, for many years Professor of Latin at Trinity College; the income to be used for a collection of books in the General Library in the field of Latin. 1,813.63 WILLIAM B. HAMILTON FUND Established September, 1965 by gift from Professor William B. Hamilton and supplemented by additional gifts; the income to be used for purchase of manuscripts of British and Imperial History. 1,100.00 F. M. HANES BEQUEST TO DEPARTMENT OF MEDICINE Established 1951 by bequest from F. M. Hanes; comprised of 20% of the proceeds from the Trust; the income to be used for the promotion of the highest standards of medical teaching and for medical research. 203,589.65 F. M. HANES BEQUEST TO SCHOOL OF MEDICINE Established 1951 by bequest from F. M. Hanes; comprised of 20% of the proceeds from the Trust; the income to be used for the promotion of the highest standards of medical training and for medical research. 203,589.65 FREDERIC M. HANES MEMORIAL TRUST FUND Established 1959 by bequest from Mrs. Elizabeth P. Hanes; comprised of 20% of the proceeds from the Trust; the income to be used for the promotion of medical teaching and medical research. 7,881.30 P. HUBER HANES FUND Established 1939 by gift of P. Huber Hanes, '00; the income to be used as follows: three-fifths for the support of the P. Huber Hanes Scholarships; one-fifth to the P. Huber Hanes, Jr. Scholarship; and one-fifth to the Duke University Press. 136.810.23 HOSPITAL CHAPLAINS' FUND FOR COMPASSION Established 1963 by various contributors, in memory of Dorothy

Thigpen Elliot; to be used for pastoral care of patients and members of their family, compassionate expense items and special events

and services in the Hospital Chapel.

BOOK VALUE WALKER P. INMAN MEMORIAL GRANT Established July 2, 1959 by bequest from Georgia Inman; the income to be used for furthering and promoting research into the subject of heart disease and other heart ailments. 250,540.20 THE JONES CHAIR OF ENGINEERING FUND Established 1951 by gifts from J. A. Jones Construction Company, Mr. Edwin L. Jones, '12, Mrs. Annabel Lambeth Jones, '12, Mr. Edwin L. Jones, Jr., '48, and Lucille Finch Jones, and supplemented by other gifts; the income to be used for the benefit of the College of Engineering as salaries, a professorship, scholarships or research. 228,385,20 HENRY HARRISON JORDAN MEMORIAL FOUNDATION Established 1947 by gifts from Mrs. George Way, B. Everett Jordan, '18, H. W. Jordan, Charles E. Jordan, '23, Mrs. H. C. Sprinkle, Jr., '24, and Frank B. Jordan, '27, children of Reverend Henry Harrison Jordan, of the residue of the estate of their father, supplemented by additional gifts; the income to be used for the support of the Ministers' Loan Library of the Duke Divinity School. 48,143.90 THE WILLIAM ARTHUR KALE, JR., MEMORIAL FUND Established 1964 by gift from W. A. Kale, '25, and Ruth Rogers Kale, in memory of William Arthur Kale, Jr., '58; the income to be used annually to purchase books and other materials in the areas of fine arts and religious musicology in the library of the Divinity School of Duke University. 3,320.73 J. WALTER LAMBETH FUND Established January, 1966 by transfer from J. Walter Lambeth Current Restricted Fund; the income to be used for books on the subject of the promotion of international understanding. 14,058.95 LIBRARY ENDOWMENT FUND Established 1939 by contributions from a number of individuals in connection with the Centennial celebration of Duke University; the income to be used for the General Library of Duke University. 5,347.56 NELLIE McCLEES FUND Established 1963 by gift from Nellie McClees, '02; the income to be transferred annually to the Duke University Loyalty Fund. 652.83 MEDICAL SCHOOL RESEARCH FUND Established 1939 by contributions from a number of individuals in

connection with the Centennial celebration of Duke University; the

9,066.19

income to be used for medical research.

BOOK VALUE

J. M. Ormond Fund for the Training of Ministers for the Rural Church

Established December 11, 1948 by gifts through the Methodist College Advance and supplemented subsequently by additional gifts; the income to be used to do research work in the rural church field of the North Carolina Conference of the Methodist Church of the Southeastern Conference.

188,898.33

ORMOND MEMORIAL FUND

Established 1924 by Dr. J. M. Ormond, '02, and Mrs. Ormond, in memory of his mother and father, Mr. and Mrs. J. J. Ormond; the income to be used for the purchase of a collection of books on the rural church for the Library of the Divinity School at Duke University.

3.017.98

LUCILLE PARKER FUND

Established January, 1966 by gift from Professor Harold T. Parker and supplemented by additional gifts; the income to be used to strengthen the holdings of Duke University Library.

1.200.00

PUBLICATIONS SINKING FUND

Established by the Publications Board of Duke University to serve as a reserve for the publications operated under its direction.

39.914.95

R. J. REYNOLDS PROFESSORSHIP FUND

Established December, 1965 by gift from the R. J. Reynolds Tobacco Company; the income to be used for a professorship in the School of Medicine.

252.465.30

THE BOB SEIBELS, JR., M.D. MEMORIAL LABORATORY FUND

Established 1956 by bequest from Robert E. Seibels, M.D. for the purpose of establishing a Laboratory of Gynecological and Obstetrical Research at Duke University.

37,255.17

THE ETTIE STETTHEIMER MEMORIAL HEART RESEARCH FUND

Established 1957 by bequest of Ettie Stettheimer; the income to be used for research in the cause, treatment and prevention of heart disease.

13.047.11

HILDA HOWES THOMAS FUND

Established 1956 by gift from J. M. Thomas; the income to be used by the Music Department of Duke University to subsidize projects stimulating interest in the fine arts.

4,339,91

WILLIAM P. TUDOR FUND

Established 1956 by gift from William P. Tudor, '56; the income to be transferred annually, one-half to the General University Scholarship Fund and one-half to the Duke University Loyalty Fund.

1,029.18

BOOK VALUE GRATTON WILLIAMS FUND Established 1920 by bequest of Gratton Williams; the income to be used for the general purposes of Duke University, particularly for the development of the Library. 3.017.98 LUTHER K. WILLIAMS FUND Established 1961 by gift of Luther K. Williams, '36; the income to be transferred annually to the Duke University Loyalty Fund. 1,131.79 JAMES J. WOLFE MEMORIAL FUND Established 1921 by his friends and former students in memory of Dr. James J. Wolfe, Professor of Biology at Trinity College from 1904 until his death in June, 1920; the income to be used to purchase periodicals relating to biology. 3.145.88 SUE EGGLESTON WOODWARD MEMORIAL FUND Established January, 1966 by transfer from Current Restricted Fund contributions from various donors; 80% of the income to be used by the Dean of the School of Medicine to aid any medical student in need of funds, the remainder of the income to be added to the principal of the fund annually. 8,727.17 LIZZIE TAYLOR WRENN FOUNDATION FUND Established 1921 by gift from Mrs. May Wrenn Morgan, '08, and her husband, John Allen Morgan, '06, in memory of Mrs. Morgan's sister, Lizzie Taylor Wrenn, '12; the income to be used for purchase of books for the Library of Duke University. 1.769.59 5,612,072.55 Income Restricted for Student Loans: CHARLES WHITLOCK BANNER LOAN FUND Established 1953 by gift from Mrs. Edward B. Benjamin; the income to be used for loans to medical students. 1,928.85 PAUL M. BARRINGER BEQUEST FUND Established 1932 by bequest from Paul M. Barringer; the income to be used in educating worthy young people, preference to be given those from Rowan County, N. C. 13,968.69 FANNIE CARR BIVINS MEMORIAL LOAN FUND Established 1928 by the Alumnae Association, in memory of Fannie Carr Bivins, '96; income to be loaned to young women students upon the recommendation of the Alumnae Council and approval by the Dean of Women. 2,824.82

BOOK VALUE BRANSON LOAN FUND Established 1953 by bequest of Mrs. Clara S. Odell; the income to be used for loans to needy students. 6.643.72 JESSE A. CUNINGGIM LOAN FUND Established 1896 by Reverend J. A. Cuninggim, '90; to be loaned 8.990.12 to young men preparing for the ministry. B. D. HEATH LOAN FUND Established 1921 by B. D. Heath of Charlotte, N. C.; income to be used for students preparing for the ministry, preference to be given to one student annually from Union County, N. C. 7.543.69 HOLMES-MCCAUSLAND LOAN FUND Established 1946 by gifts of Alfred M. McCausland and Frances Holmes McCausland, '26, in memory of their parents; the principal or income to be used for loans to students in the Divinity School. 12,215.65 HOLLAND HOLTON MEMORIAL LOAN FUND Established March, 1948 by friends and former students in memory of Holland Holton, '07, Professor of Education and Director of the Summer School of Duke University for many years; to be used in helping worthy young men and women in securing a 4,459.51 college education. MARSHA PAULK MEMORIAL LOAN FUND Established 1958 by gifts from the students of the Duke University School of Physical Therapy and friends of Marsha Paulk; to be used for loans to full-time students enrolled in the School of Physical Therapy. 929.49 HENRY SIMPSON PROCTOR LOAN FUND Established 1957 by gift from Mrs. A. M. Proctor, Mrs. Alberta Proctor Hyde, Mrs. Julia Proctor Makosky and Hugh W. Proctor, in memory of Arthur Marcus Proctor, '10; the income to be used for aid to graduate students in the Department of Education. 6,557.48 HENRY CARSON WEST LOAN FUND Established 1954 by gift from H. Carson West, '17, and supplemented subsequently by additional gifts; to provide loans for upper-classmen from North Carolina. 1,543.65 67,605.67 FUND FUNCTIONING AS ENDOWMENT 2,595,603.65 TOTAL \$60,551,684.48

NOTES

- (1) During the year the University reclassified unexpended accumulations of endowment income from endowment funds to current restricted funds. This change was in accordance with the generally accepted reporting format as set forth in "Volume I—College and University Business Administration" (American Council on Education), the authoritative literature on this subject in the educational field.
- (2) Certain Endowed Funds established for the benefit of Duke University have independent trustees. The following information is furnished by the trustees:

Income Restricted for Student Aid:

MARY ALYSE SMITH SCHOLARSHIP FUND

Established December, 1946 by Alyse Smith, '30, of Burlington, North Carolina, now Mrs. Wilbur Cooper, and her father, M. B. Smith (deceased 1952), with Central Carolina Bank & Trust Company as Trustee: supplemented in 1947, 1948, 1957 and 1958 by Alyse Smith. Income to be used for scholarship aid to worthy North Carolina boys and girls entering the freshman class.

Book Value April 1, 1966

\$ 22,909.20

Income Restricted for Other than Student Aid:

THE DURHAM FOUNDATION: ALYSE SMITH COOPER FUND FOR DUKE UNIVERSITY

Established December 31, 1964 by Alyse Smith, now Mrs. Wilbur N. Cooper, class 1930, of Burlington, North Carolina, with Central Carolina Bank & Trust Company as Trustee. Principal and accumulated income earmarked for construction equipment and support of music and musical education portions of future Arts Center.

Book Value April 1, 1966

13,225.37

JAMES A. GRAY TRUST

The James A. Gray Trust was created December 21, 1946, with the Wachovia Bank and Trust Company as Trustee. The official name is. "The Winston-Salem Foundation." Under the terms of the agreement, Duke University will receive 2/35ths of the income for use "in operating and maintaining its educational services in behalf of North Carolina churches and pastors, particularly, rural churches and pastors." According to the statement furnished by the Trustee, the book value of the trust at November 30, 1965 was:

4,477,594.00

FREDERIC M. HANES BEQUEST

Wachovia Bank and Trust Company, Winston-Salem, North Carolina, Trustee of trust created under Will of Frederic M. Hanes for the benefit of the Unit of Duke University known as the Duke University Medical School and Hospital.

Total Book Value at the close of the Trust Year on May 8, 1966.

3,301,002.07

BOOK VALUE

FREDERIC M. HANES MEMORIAL TRUST

Wachovia Bank and Trust Company, Winston-Salem, N. C. Trustee under agreement with Elizabeth P. Hanes for Frederic M. Hanes Memorial Trust of Duke University Medical School. Total Book Value at the close of the Trust Year on June 1, 1966. \$

95,909.18

Income Restricted for Student Loans:

ALBERT ANDERSON BEQUEST

Wachovia Bank and Trust Company, Raleigh, North Carolina, Trustee of trust created under Will of Albert Anderson for use as a Loan Fund to Methodist Students attending Duke University. Total Book Value at the close of the Trust Year on March 27, 1966.

29,742.60

SCHEDULE B—STUDENT LOAN FUNDS

	BOOK VALUE
ALOE CHARITABLE TRUST LOAN FUND FOR STUDENTS IN HOSPITAL ADMINISTRATION Established 1962 by gift of Aloe-Medical Division of Brunswick Corporation; to be used for loans to students in the graduate courses in hospital administration at Duke University.	\$12,097.67
Alumni Loan Fund Established 1915 by gift from the Alumni Association.	1,867.45
Albert Anderson Loan Fund Established in 1952 by accumulation of the income from the bequest of Albert Anderson, '83, for current use in aiding and assisting in the education of worthy and deserving young men and women of the Methodist faith.	29,425.73
DENIS CAMPBELL ANDREWS ORTHOPAEDIC LOAN FUND Established 1961 by gift of Mrs. Nancy Long; to be used for loans to medical students.	1,000.00
CHARLES WHITLOCK BANNER LOAN FUND Established 1953 by gift from Mrs. Edward B. Benjamin; the income to be used for loans to medical students.	864.22
Paul M. Barringer Bequest Fund Established 1932 by bequest from Paul M. Barringer; the income to be used in educating worthy young people, preference to be given those from Rowan County, N. C.	13,639.94
BYNUM BELOTE LOAN FUND Established 1924 by E. T. Belote of Asheville, N. C., in memory of his son, Alfred Bynum Belote, student, 1923-24.	5,745.17
 A. D. Betts Loan Fund Established 1919 by Reverend G. W. Vick, '11, and wife, in memory of Reverend A. D. Betts, a member of the North Carolina Conference; other contributions by Reverend W. A. Betts and Mrs. L. P. Wilkins; to be used for the aid of young men preparing for the ministry. 	3,151.98
FANNIE CARR BIVINS MEMORIAL LOAN FUND Established 1928 by the Alumnae Association, in memory of Fannie Carr Bivins, '96; income to be loaned to young women students upon the recommendation of the Alumnae Council and approval by the Dean of Women.	3,395.03
Branson Loan Fund Established 1953 by bequest of Mrs. Clara S. Odell; the income to be used for loans to needy students.	3,146.61

BOOK VALUE CHRISTIAN EDUCATION LOAN FUND Established 1921 as a part of the Christian Education movement of the Methodist Church in North Carolina; for use as a general loan fund. S 2.915.79 CLASS OF 1902 LOAN FUND Established 1932 by the members of the class at their 30th Anniversary Reunion. 1.224.29JESSE A. CUNINGGIM LOAN FUND Established 1896 by Reverend J. A. Cuninggim, '90; to be loaned to young men preparing for the ministry. 18,171.30 J. B. DUKE CHURCH EXTENSION LOAN FUND Established 1925 by gift from James B. Duke; to be used for the aid of young men preparing for the ministry. 9.503.59 ALEXANDER EDENS MEMORIAL LOAN FUND Established 1920 by Lacy T. Edens, '24, Cora R. Edens, John A. Edens, L. D. Edens, '15, and L. F. Edens, in memory of Alexander Edens. 5,387.87 SCHOOL OF FORESTRY LOAN FUND Established 1940 by gifts of various persons; to be used for the aid of students in the School of Forestry. 1,798.08 GENERAL LOAN FUND Established 1900 by the North Carolina Conference and supplemented from time to time by additional contributions by both the North Carolina Conference and the Western North Carolina Conference; to be used for no other purpose than to aid worthy 94,269.59 students of the University. W. O. GOODE EDUCATIONAL LOAN FUND Established 1923 by Reverend W. O. Goode of the Western North Carolina Conference. 2,246.26 MARY HESTER HAMBRICK LOAN FUND Established 1925 by W. R. Hambrick, Haldah Satterfield, John Jackson Hambrick, '16, and Dr. Robert T. Hambrick, '19, in memory of Mary Hester Hambrick, wife and mother; loans to be made to any needy students, preferably from Person County, N. C. 3.221.93 F. M. HANES GRADUATE MEDICAL LOAN FUND Established in December, 1952 by transfer from the Current Restricted "F. M. Hanes Bequest to the School of Medicine Fund"; to be used for loans to post-graduate medical students. 186,139,74

	BOOK VALUE
P. Frank Hanes Loan Fund Established 1934 by P. Frank Hanes, '11; administered by a Loan Fund Committee of the Law School; loans to needy and deserving law students.	3 4,028.71
HEALTH PROFESSIONS STUDENT LOAN FUND Authorized by Part C of the Health Professions Educational Assistance Act of 1963; loans to medical students qualifying under provisions of the Act.	213,627.78
B. D. HEATH LOAN FUND Established 1921 by B. D. Heath of Charlotte, N. C.; income to be used for students preparing for the ministry, preference to be given to one student annually from Union County, N. C.	9,453.28
HOLMES-McCausland Loan Fund Established 1946 by gifts of Alfred M. McCausland and Frances Holmes McCausland, '26, in memory of their parents; the principal or income to be used for loans to students in the Divinity School.	8,726.42
HOLLAND HOLTON MEMORIAL LOAN FUND Established March, 1948 by friends and former students in memory of Holland Holton, '07, Professor of Education and Director of the Summer School of Duke University for many years; to be used in helping worthy young men and women in securing a college education.	2,804.40
J. B. IVEY LOAN FUND Established 1922 by J. B. Ivey of Charlotte, N. C.; to be used for loans to worthy students.	4,452.91
W. K. KELLOGG FOUNDATION LOAN FUND FOR MEDICAL STUDENTS Established 1942 by gift of the W. K. Kellogg Foundation; to be used for loans to medical students.	20,491.76
W. K. KELLOGG FOUNDATION LOAN FUND FOR MEDICAL TECHNOLOGY Established 1943 by gift of the W. K. Kellogg Foundation; to be used for loans to students in the field of medical technology.	2,072.48
W. K. KELLOGG FOUNDATION LOAN FUND FOR NURSES Established 1942 by gift of the W. K. Kellogg Foundation; to be used for loans to students in the School of Nursing.	3,496.99
W. K. KELLOGG FOUNDATION LOAN FUND FOR PHYSICAL THERAPY Established 1943 by gift of the W. K. Kellogg Foundation; to be used for loans to students receiving training in physical therapy.	4,463.32

	BOOK VALUE
W. K. KELLOGG FOUNDATION LOAN FUND FOR STUDENTS IN HOSPITAL ADMINISTRATION	
Established 1962 by gift from W. K. Kellogg Foundation; to be used for loans to graduate students in hospital administration at Duke University.	5 15,163.50
Masonic Loan Fund Established 1923 by the North Carolina Masonic Educational Loan Fund Committee; to be used for aid to worthy students.	845.78
Medical Freshman Tuition Loan Fund Established August 28, 1960 by gift from Dr. George W. Brumley, Jr., '56, and Mrs. Jean Stanback Brumley, '58; to be loaned to fresh- men in the School of Medicine.	9,478.42
Medical Post-Graduate Loan Fund Established in August, 1954 by transfer from Current Restricted "F. M. Hanes Bequest to the Department of Medicine Fund"; to be used for loans to post-graduate students in medicine.	97,082.53
Medical Students Loan Fund Established 1941 by gifts of various persons.	628.46
GEORGE W. MERCK MEMORIAL LOAN FUND Established 1963 by gift from the Merck Company Foundation; to be used for loans to post-graduate students in the Duke University School of Medicine.	12,151.00
MINISTERIAL EDUCATION LOAN FUND Established 1915 by the North Carolina Conference of the Methodist Church; to be used for loans to students preparing for the ministry.	5,486.64
NATIONAL DEFENSE STUDENT LOAN PROGRAM Established under Title II of the National Defense Education Act of 1958; loans to students qualifying under provisions of the Act.	1,713,210.45
WILLIAM NEAL STUDENT AID FUND Established 1920 by John W. Neal in memory of his son, William Neal, student in 1919; to be used for loans to worthy and needy students.	5,246.15
NORTH CAROLINA CONFERENCE BOARD OF CHRISTIAN EDUCATION LOAN FUND Established 1931 by gift of the Board of Christian Education of the North Carolina Conference; to be used for loans to students preparing for the ministry or other distinctive type of Christian service.	9,898.32

	BOOK VALUE
NURSING STUDENT LOAN PROGRAM Authorized by Part B of the Nurse Training Act of 1964; loans to nursing students qualifying under provisions of the Act.	\$ 15,000.00
Marsha Paulk Memorial Loan Fund Established 1958 by gifts from the students of the Duke University School of Physical Therapy and friends of Marsha Paulk; to be used for loans to full-time students enrolled in the School of Physical Therapy.	697.06
HENRY SIMPSON PROCTOR LOAN FUND Established 1957 by gift from Mrs. A. M. Proctor, Mrs. Alberta Proctor Hyde, Mrs. Julia Proctor Makosky and Hugh W. Proctor, in memory of Arthur Marcus Proctor, '10; the income to be used for aid to graduate students in the Department of Education.	2,392.07
PSYCHIATRY LOAN FUND Established 1956 by transfer from Psychiatry Department Operating Fund; to be used for loans to post-graduate students in Psychoanalysis.	14,271.88
W. N. REYNOLDS LOAN FUND Established by W. N. Reynolds, '86, of Winston-Salem, N. C.; to be used for loans to boys and girls of North Carolina seeking an education at Duke University; preference, however to be given to the children of employees of the R. J. Reynolds Tobacco Company, regardless of residence.	172,895.07
ROANOKE RAPIDS HIGH SCHOOL LOAN FUND Established 1925 by the graduating class of the Roanoke Rapids High School, Roanoke Rapids, N. C.; to be used for loans to students who are graduates of that school.	918.18
Scott Loan Fund Established in October, 1952 by I. M. Scott, '32, and supplemented subsequently by additional gifts; to be used for loans to medical students.	5,501.93
THE COLONEL HAMILTON FOLTS SEARIGHT LOAN FUND Established 1957 by gift from Mrs. Louise Searight Morell, '42; to be used for the aid of students pursuing a science curriculum.	557.09
JOSEPH F. STEIN STUDENT LOAN FUND Established 1961 by gifts of Mr. Joseph F. Stein to the Duke University School of Nursing; to be used for loans to students in the School of Nursing.	4,260.09

BOOK VALUE

TOTAL \$2,781,495.05

FINANCIAL REPORT

Schedule B (Continued)—Student Loan Funds

SURGICAL POST-GRADUATE LOAN FUND Established 1954 by transfer from the Department of Surgery Fund; to be used for loans to post-graduate students in surgery. 5,343.32 ELLA WESCOTT TUTTLE LOAN FUND Established 1923 by Reverend D. H. Tuttle, '80, in memory of his wife, Ella Wescott Tuttle; to be used for loans to worthy young women seeking an education at Duke University. 5.221.11JOSHUA VICK MEMORIAL LOAN FUND Established 1920 by Mrs. J. W. Vick in memory of her husband, Joshua Vick; to be used for loans to needy students. 2,405.39 WAKE COUNTY ALUMNAE LOAN FUND Established 1924 by the Raleigh Chapter of the Alumnae Association; to be used for loans to worthy women students. 4,249.15 HENRY CARSON WEST LOAN FUND Established 1954 by gift from H. Carson West, '17, and supplemented subsequently by additional gifts; to provide loans for upper-classmen from North Carolina. 505.79 LUCY T. WOOLARD MEDICAL LOAN FUND Established 1962 in memory of Lucy T. Woolard by her daughters, Wylma, Rachel, and Margaret Woolard and Thelma Soloway; the principal and income to be used for loans to interns and residents in the Duke University Medical Center whose interests include the study of diseases of the blood. 2,506.67 MARY POAGE WOOTEN LOAN FUND Established 1922 by Reverend John C. Wooten, '98, in memory of his wife, Mary Poage Wooten; to be used for loans to worthy students. 2,748.71

SCHEDULE C—CURRENT RESTRICTED FUNDS

	Balance	Dogwined	Dishumond	Balance
Research:	July 1, 1965	Received	Disbursed	June 30, 196€
Government: Air Force	\$ 55,230.87 (259,522.38)	\$ 145,838.78	\$ 199,183.27	\$ 1,886.38
Army Atomic Energy Commission	(259,522.38) (44,344.81)	\$ 145,838.78 1,659,056.10 697,765.86	\$ 199,183.27 1,837,751.08 875,801.99	\$ 1,886.38 (438,217.36) (222,380.94)
National Academy of Sciences National Aeronautics and Space	(1,832.66)	5,953.65	13,004.06	(8,883.07)
Administration	(24,268.89) 153,333.67	168,700.63	145,696.39 1,255,563.58	(1,264.65)
National Science Foundation Navy	(40,241.00)	82.084.83	1,255,563.58 118,521.52	35,570.09 (76,677.69)
North Carolina Board of Health U. S. Department of Agriculture	(10, 916, 50)	64 568 31	57,115.68 22,587.31	(3.463.87)
U. S. Fish and Wildlife Service U. S. Office of Education	21,154.37 (39,587.33) 1,543.80	38,802.01		868.44 (785.32)
U. S. Office of Education U. S. Public Health Service U. S. Social Security Administration	(213,024.67)	6,094,714.16	34,351.36 5,462,981.32	334.64 418,708.17
U. S. Social Security Administration Vocational Rehabilitation	_	5,132.35	7,479.46	(2,347.11)
Administration	37,488.28	92,759.38	134,734.14	(4,486.48)
Non-Government	(364,987.25) 5,110,793.61	$\substack{10,228,619.64\\3,068,211.10}$	10,164,771.16 4,006,305.54	(301,138.77) 4,172,699.17
Total Research	4,745,806.36	13,296,830.74	14,171,076.70	3,871,560.40
Training:				
Government: Atomic Energy Commission	11.21	_	11.21	_
Navy North Carolina Board of Health	(9,558.27) (1,568.81)	13,013.14	16,455.85	(13,000.98)
National Science Foundation	(1,500.01) —	16,150.00 272,224.28 137,458.62	16,455.85 13,390.28 278,915.99 137,650.07	1,190.91 (6,691.71)
Peace Corps U. S. Department of Agriculture	_	1 500.00	1,752.70	(191.45) (252.70)
U. S. Fish and Wildlife Service U. S. Office of Education U. S. Public Health Service	(2,665.17)	4,700.00	34,624.97	4,700.00 45,566.90 (41,575.06)
U. S. Public Health Service Vocational Rehabilitation	(51,051.02)	2,742,962.75	2,733,486.79	(41,575.06)
Administration	10,779.11	17,914.52	28,093.63	600.00
Non-Government	(54,052.95) 155,668.25	3,288,780.35 143,522.15	3,244,381.49 133,769.78	(9,654.09) 165,420.62
Total Training	101,615.30	3,432,302.50	3,378,151.27	155,766.53
Special Programs:				
Government: National Science Foundation		13.878.97	4,569.07	9,309.90
U. S. Office of Education U. S. Public Health Service	(1,415.23) 103.23	13,878.97 13,274.13 32,798.63	13,738.26 33,438.69	(1,879.36) (536.83)
Veterans Administration Hospital		16,375.00	35,498.43	(19,123.43)
Non-Government	(1,312.00)	76,326.73 2,797,359.32	87,244.45 3,324,136.84	(12,229.72) 3,642,277.99
	4,169,055.51			
Total Special Programs	4,167,743.51	2,873,686.05	3,411,381.29	3,630,048.27
Libraries: Non-Government	180,091.74	232,230.09	195,038.85	217,282.98
Professorships:				
Non-Government	380,051.66	406,262.29	342,764.47	443,549.48
Student Aid: Government:				
National Aeronautics and Space Administration	(16,261.30)	165 001 09	151,206.02	(2 375 50)
National Science Foundation U. S. Fish and Wildlife Service	53,061.15	165,091.82 107,193.01	127,866.76 4,406.66	32,387.40
U. S. Public Health Service	9,409.49 (11,621.79)	207.17 161,144.14	155,050.41	(2,375.50) 32,387.40 5,210.00 (5,528.06)
Non-Government	34,587.55	433,636.14	438,529.85	29,693.84
Total Student Aid	685,924.62	1,153,087.84	1,096,869.82	742,142.64
	720,512.17	1,586,723.98	1,535,399.67	771,836.48
Summary: Government	(385,764.65)	14,027,362.86	13,934,926.95	(293,328.74) 9,383,372.88
Non-Government	10,681,585.39	7,800,672.79	9,098,885.30	9,383,372.88
Grand Total	\$10,295,820.74	\$21,828,035.65 ========	\$23,033,812.25	\$ 9,090,044.14

SCHEDULE D-GIFTS AND GRANTS FOR RESEARCH

T				
1N	DI	VIL	UA	Ls:

Anonoymous Sydney M. Cone P. C. Gregory, Jr. F. M. Hanes Bequest to Department of Medicine F. M. Hanes Bequest to School of Medicine Frederic M. Hanes Memorial Trust Amos Kearns Walter Kempner Paula Van Klein Mr. & Mrs. F. A. Landis Dr. Richard Lister James H. Semans William Seward, Jr. Edward Williams 117 Other Contributors	\$ 10,500.00 100.00 500.00 e 77,236.58 77,236.57 5,421.04 500.00 22,000.00 500.00 1,000.00 200.00 1,350.00 2,500.00 4,243.18	\$ 203,787.37
Industry:		
Abbott Laboratories American Tobacco Company Ayerst Laboratories Barrus Construction Company Duke Laboratories, Inc. E. I. DuPont de Nemours & Company Eaton Laboratories Ethicon, Inc. First Securities Corp. Foregger Co. S. M. Frank & Co., Inc. Greenwood Mills Hoffman-LaRoche, Inc. Ives Labs, Inc. Johnson & Johnson Koby Drugs Co. Eli Lilly & Co. McNeil Labs, Inc. Mead Johnson & Co. Merck and Co., Inc. Neisler Laboratories, Inc. The Norwich Pharmacal Co. Ohio Chemical Surgical Equipment Co. Olin Mathieson Chemical Corporation Parke Davis & Co. Chas. Pfizer & Co. Procter & Gamble Company Profexray, Inc.	2,000.00 22,000.00 23,250.00 600.00 500.00 10,295.89 3,600.00 4,800.00 750.00 500.00 4,742.00 1,500.00 6,000.00 26,300.00 2,250.00 2,500.00 3,125.00 9,120.00 4,170.00 3,000.00 2,500.00	
A. H. Robins Company, Inc. Southern Pulpwood Conservation Association Sterling Drug, Inc.	5,500.00 4,800.00 2,000.00	
Upjohn Company Valk Manufacturing Co. Vitamix Pharmaceutical Co. Warner-Lambert Pharmaceutical Co. Workward Phermaceutical Co.	3,800.00 500.00 2,500.00 10,500.00	
Westwood Pharmaceuticals Winthrop Laboratories 1 Other Contributor	2,250.00 6,500.00 150.00	210,135.89

Schedule D (Continued)—Gifts and Grants for Research

FOUNDATIONS:

American Academy of Pediatrics American Board of Neurological Surgery American Cancer Society American Chemical Society American Heart Association American Medical Association American Thoracic Society	\$ 500.00 1,077.12 197,529.95 5,834.00 60,850.00 67,300.25 (214.07)	
Mary R. Babcock Foundation Mary Duke Biddle Foundation	12,500.00 $9,572.00$	
China Medical Board of New York Council for Tobacco Research	1,200.00 28,803.50	
Danforth Foundation The Duke Endowment	5,548.80 $60,000.00$	
Easter Seal Research Foundation Esso Education Foundation	10,000.00 4,000.00	
The Ford Foundation Herman Frasch Foundation	119,377.97 $10,000.00$	
General Electric Foundation John Hartford Foundation	15,000.00 $131,595.00$	
Henderson County Cancer Service Walter Kempner Foundation	1,000.00 10,000.00	
Licensed Beverage Institute, Inc. Life Insurance Medical Research Fund The John and Mary R. Markle Foundation	5,000.00 46,970.00 1,171.14	
Muscular Dystrophy Association of America, Inc. National Association of Mental Health, Inc.		
National Council to Combat Blindness, Inc. National Cystic Fibrosis Foundation	3,000.00 27,933.00	
National Fund for Medical Education North Carolina Heart Association	12,500.00 49,248.50	
North Carolina Tuberculosis Association Research to Prevent Blindness, Inc.	15,556,00 $2,800.00$	
Raczynski Foundation Resources for the Future, Inc.	5,000.00 (472.09)	
Rockefeller Foundation Damon Runyan Memorial	17,878.00 $22,400.00$	
Shell Companies Foundation Southern Society of Orthodontists	10,000.00	
United Medical Research Foundation World Peace Through Law Center	20,210.00 3,000.00	@ 1 010 264 97
3 Other Contributors	445.20	\$ 1,010,364.27

GOVERNMENT:

Atomic Energy Commission	868,895.25
National Academy of Sciences	11,062.15
National Aeronautics and Space Administration	205,270.53
National Science Foundation	1,361,341.84
State of North Carolina	8,998.27
North Carolina Board of Health	68,910.42
North Carolina Board of Science and	
Technology	29,895.32
Office of Education	33,400.58
Smithsonian Institute	4,000.00
Social Security Administration	5,800.00
United States Air Force	183,517.05
United States Army	1,920,208.62

Schedule D (Continued)—Gifts and Grants for Research

United States Department of Agriculture	\$ 4,385.79	
United States Fish and Wildlife Service	20,918.00	
United States Navy	106,809.73	
United States Office of Vocational		
Rehabilitation	125,584.06	
United States Public Health Service	6,873,515.79	\$11,832,513.40
		\$ 13,256,800.93

SCHEDULE E—GIFTS AND GRANTS FOR TRAINING PROGRAMS

American Cyanamid Company	\$	4,000.00
James A. Gray Trust	47.	13,914.33
Charles F. Kettering Foundation		96,601.00
National Science Foundation		295,653.24
State of North Carolina		16,150.00
North Carolina Conference of The Methodist Church		3,143.75
Office of Education		83,856.00
Peace Corps		150,751.68
South Carolina Conference of The Methodist Church		900.00
Southeastern Jurisdictional Conference		7,319.74
United States Department of Agriculture		1,500.00
United States Fish and Wildlife Service		4,700.00
United States Navy		14,132.99
United States Public Health Service	2	2,940,929.24
United States Vocational Rehabilitation Administration		19,032.60
Virginia Conference of The Methodist Church		2,581.36
West Virginia Conference of The Methodist Church		3,277.80
Western North Carolina Conference of The Methodist Church		3,087.60
2 Other Contributors		233.00

\$ 3,661,764.33

SCHEDULE F—GIFTS FOR SPECIAL PROGRAMS

American Chemical Society	\$	583.00
American Cyanamid Company	Ф	25,800.00
		500.00
American Heart Association		
American Hospital Association Educational Trust		23,600.00
American Tobacco Company		25,000.00
Ayerst Labs		7,500.00
Mary R. Babcock Foundation		24,950.00
Mary Duke Biddle Foundation		70,600.00
John Bilitz		500.00
Bird Corporation		1,500.00
Board of Education of The Methodist Church		105,000.00
Margaret Blomquist		700.00
Kenneth M. Brim		1,315.00
Burlington Industries Foundation		1,000.00
Carnegie Corporation		25,000.00
The Chase Manhattan Bank		500.00
Center for Continuing Medical Education		8,500.00
Norman A. Cocke		25,000.00
Lawrence Davies		3,015.97
William S. Dosher		2,687.58
E. I. DuPont de Nemours & Company		5,000.00

Schedule F (Continued)—Gifts for Special Programs

The Duke Endowment	\$ 507,000.00
Duke Alumni Office	3,221.75
Doris Duke	29,925.11
Educational Facilities Laboratories, Inc.	45,000.00
Ernst & Ernst	500.00
Lupus Erythematosus Foundation, Inc.	3,000.00
Esso Education Foundation	45,750.00
Thomas A. Finch Foundation	25,000.00
The Ford Foundation	(3,004.32)
Geig Chemical Corp.	1,000.00
Golden Cross Fund	8,400.00
R. C. Haberkern	500.00
Hanes Corporation Foundation	2,000.00
Edward W. Hazen Foundation	12,975.00
Indiana University	3,000.00
George Ivey	20,000.00
Jordan Spinning Co.	3,500.00
W. K. Kellogg Foundation	23,720.00
Walter Kempner	6,266.59
Kendall Company Foundation	1,000.00
Coorgo F Kirby	
George F. Kirby	1,950.00
Lakeside Laboratories	500.00
Hoffman-Laroche, Inc.	2,500.00
Eli Lilly and Company	6,000.00
P. Lorillard Co.	(3,094.88)
John Lucas, Jr.	500.00
George McGehee	1,000.00
George McIvey	1,000.00
Maybelline Co.	1,000.00
The Merck Company Foundation	21,500.00
William Merrill Co.	1,500.00
Jeremiah Milbank	575.63
Dr. Ben Miller	5,000.00
	2 500 00
National Drug Co.	2,500.00
National Science Foundation	31,928.01
Elizabeth Navarro	500.00
State of North Carolina	10,220.80
North Carolina Conference of The Methodist Church	20,231.61
North Carolina Pastor's School	1,300.00
North Carolina Board of Science and Technology	100,000.00
North Carolina State Board of Health	(1,200.00)
Nuclear Consultants Corporation	500.00
T. L. Perkins	25,875.00
Population Council	5,000.00
	16,325.00
Henry E. Rauch	
A. H. Robins, Inc.	1,750.00
G. D. Searle & Co.	3,000.00
Sellers Dying Co.	3,000.00
Sellers Manufacturing Co.	3,500.00
Smith, Kline & French Laboratories	5,000.00
State of South Carolina	1,650.00
Southern Education Fund	1,840.00
Southern Regional Education Board	38,933.34
Warren Stack	500.00
Robert Taft Institute	2,000.00
Richard Thigpen	1,000.00
United States Government	2,950.00
United States Public Health Service	47,829.65
U. S. Steel Foundation	\$ 20,000.00
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Schedule F (Continued)—Gifts for Special Programs

Valdese Manufacturing Foundation	750.00
Veterans Administration Hospital	16,875.00
George R. Wallace	7,000.00
Western North Carolina Conference of The Methodist Church	48,891.00
Winthrop Labs	1,750.00
John E. Woodward	3,906.37
Wyeth Laboratories	3,000.00
Helen and Coleman Zageir Foundation, Inc.	1,000.00
210 Other Contributors	20,932.32
	0 1 505 154 50

\$ 1,587,174.53

SCHEDULE G—GIFTS FOR THE LIBRARIES

American Association of Theological Schools Associates of the Trent Collection Mary Duke Biddle Foundation Board of Education of The Methodist Church Douglas M. Knight 28 Other Contributors	\$ 3,000.00 2,693.50 42,500.00 1,500.00 2,400.00 2,628.00
	\$ 54,631.50

SCHEDULE H—GIFTS FOR PROFESSORSHIPS

Mary Duke Biddle Foundation Doris Duke Dr. J. P. Wynne	\$ 90,620.00 151,247.54 15,310.67
	\$ 257,178.21

SCHEDULE I—GIFTS FOR CURRENT EXPENSES

merican Chemical Society		\$ 583.00
merican Medical Education Foundation		2,853.44
arthritis Foundation		500.00
Or. Deryl Hart		553.49
Gifts from Industry:		
The Alcoa Foundation	\$ 1,500.00	
Allis-Chalmers Foundation, Inc.	600.00	
American Oil Foundation	15,000.00	
Avon Products Foundation, Inc.	500.00	
Babcock & Wilcox Company	1,000.00	
Bethlehem Steel Corp.	4,000.00	
Burlington Industries Foundation	1,500.00	
The Chase Manhattan Bank Foundation	10,000.00	
Continental Oil Company	500.00	
Eastman Kodak Co.	3,000.00	
The Equitable Life Assurance Society	1,000.00	
General Motors Corp.	11,950.00	
Gulf Oil Corporation	1,000.00	
Household Finance Foundation	700.00	
The Johnson's Wax Fund, Inc.	1,000.00	
Martin Marietta Corporation Foundation	500.00	

Schedule I (Continued)—Gifts for Current Expenses

Mellon National Bank and Trust Company Merrill Lynch, Pierce, Fenner & Smith, Inc. Morgan Guaranty Bank & Trust Company Procter and Gamble Fund

R. J. Reynolds Tobacco Company

\$ 1,000.00

1,000.00 600.00 2,400.00

5,000.00

\$371,209.68

Shell Companies Foundation	5,000.00	
Southern Pacific Foundation	1,000.00	
Texaco, Inc.	1,500.00	
The Travelers Insurance Company	790.00	
Union Bag-Camp Paper Corporation	600.00	
Western Electric	1,200.00	
9 Other Contributors	2,197.00	\$ 76,037.00
Richard King Mellon Charitable Trust		50,000.00
National Defense Fellowship Fund		195,000.00
National Fund for Medical Education		24,930.00
National Merit Scholarship Corporation		13,775.00
National Society of Accountants for Co-operatives		3,862.92
The Rockefeller Foundation		2,500.00
Ruth and Vernon Taylor		500.00
5 Other Contributors		114.83

SCHEDULE J—GIFTS FOR FELLOWSHIPS AND SCHOLARSHIPS

Alcoa Foundation	\$	750.00
Allied Chemical Foundation		3,500.00
American Cancer Society		4,935.00
American Cyanamid Company		1,200.00
Anonymous		1,000.00
Asia Foundation		2,290.00
Mary Reynolds Babcock Foundation		5,600.00
Mary Duke Biddle Foundation		5,000.00
Board of Education of The Methodist Chruch		5,000.00
P. M. Bolich		600.00
Fred W. Bradshaw		1,200.00
Broyhill Education Fund		500.00
George Brumlay		1,200.00
Brunswick Pulp and Paper Co.		1,250.00
Burlington Industries Foundation		1,000.00
Carolina Paper Board Corporation		1,000.00
Coastal Plains Heart Association		6,000.00
Commonwealth Fund		15,000.00
Council for Tobacco Research		1,200.00
A. M. Covington		500.00
Angier B. Duke Memorial, Inc.	2	200,400.00
James B. Duke 100th Anniversary Fund		8,609.94
Duke University Athletic Council		16,300.00
Duke University Concessions		20,000.00
E. I. DuPont de Nemours & Company		3,000.00
Ernst & Ernst Foundation		500.00
George D. Finch		650.00
Thomas Austin Finch Foundation		2,000.00
A. E. Finley		900.00
The Ford Foundation		54,754.85
General Motors Corporation		6,000.00

Schedule J (Continued)—Gifts for Fellowships and Scholarships

Gerber Products Company	\$ 5,000.00
Milton E. Harrington	500.00
Haskins & Sells Foundation	500.00
A. F. Hooker	500.00
W. E. Horner	500.00
Huguenot Society of America	1,000.00
B. Everett Jordan	500.00
Walter Kempner	6,006.41
Koppers Foundation	1,800.00
E. H. Lane, Jr.	1,000.00
The John and Mary R. Markle Foundation	24,000.00
Medical Student Government Association	500.00
National Aeronautics and Space Administration	165,091.82
National Science Foundation	121,615.75
Peat, Marwick, Mitchell & Co.	800.00
Floyd Pike	1,000.00
Price Waterhouse Foundation	800.00
Procter and Gamble Fund	6,348.00
Rayonier Foundation	500.00
Rockefeller Foundation	33,412.40
Seven-Up Bottling Co.	500.00
Shell Companies Foundation	21,145.00
Mary Alyse Smith Scholarship Fund	1,250.00
J. R. Smith	650.00
Texaco, Inc.	3,300.00
George Toms	1,056.65
Union Bag-Camp Paper Company	1,200.00
United States Fish & Wildlife Service	2,897.17
United States Public Health Service	186,352.61
Western Electric Foundation	1,600.00
Woodrow Wilson Foundation	20,000.00
John A. Yarbrough	550.00
318 Other Contributors	25,781.50
	\$1,009,497.10
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SCHEDULE K—GIFTS FOR LOANS

Albert Anderson Trust The Merck Company Foundation Wylma C. Woolard 9 Other Contributors	\$ 2,258.94 3,000.00 500.00 1,389.30
	\$ 7,148.24

SCHEDULE L—GIFTS FOR ENDOWMENT

John Q. Adams	\$ 1,474.53
George V. Allen	24,000.00
J. M. Atkins Estate	2,870.37
F. J. Boling Estate	5,000.00
Thomas C. Bost	38,350.00
Burlington Industries Foundation	2,295.00
Class Dues Fund	3,146.75
James Cleland	2,000.00
N. E. Ferguson, Jr. Bequest	1,014.58

Schedule L (Continued)—Gifts for Endowment

William F. Franck William B. Hamilton T. C. Heyward Lewis Jacobson Margaret Johnston Edwin L. Jones, Jr. J. A. Jones Construction Company Foundation McAfee Brothers Oil Company Mr. and Mrs. Glenn E. Mann R. A. Mayer Mrs. Davis E. Mercer John Allen Morgan Estate George E. Norman, Jr. Harold L. Parker Poplar Realty Company B. C. Remedy Co. R. J. Reynolds Tobacco Company Nathan Schwartz Mr. and Mrs. S. Donald Sherrerd E. S. Whitesides B. S. Womble John Woodward Mary Zahurak	\$ $\begin{array}{c} 1,274.48\\ 1,109.00\\ 500.00\\ 505.88\\ 500.00\\ 1,000.00\\ 25,500.00\\ 1,860.44\\ 15,000.00\\ 1,860.44\\ 15,000.00\\ 2,618.96\\ 1,200.00\\ 2,618.96\\ 1,200.00\\ 2,000.00\\ 250,000.00\\ 1,400.00\\ 1,400.00\\ 500.00\\ 2,181.25\\ 500.00\end{array}$
182 Other Contributors	\$ 7,057.84

SCHEDULE M—GIFTS FOR PLANT AND EQUIPMENT

	_
Avalon Foundation	\$ 200,000.00
Mary Duke Biddle Foundation	24,500.00
Kenneth M. Brim	4,185.00
Burlington Industries Foundation	62,500.00
Central Methodist Church, Asheville, N. C.	1,000.00
M. J. Corbett	1,000.00
Harry Dalton	10,000.00
Nanaline H. Duke Fund	197,143.71
The Duke Endowment	2,747,000.00
Duke University Athletic Association	12,000.00
First Methodist Church, Forest City, N. C.	500.00
First Methodist Church, Hickory, N. C.	500.00
First Methodist Church, Lenoir, N. C.	1,000.00
First Methodist Church, Morganton, N. C.	1,000.00
First Methodist Church, Rutherfordton, N. C.	500.00
First Methodist Church, Valdese, N. C.	1,000.00
First Methodist Church, Waynesville, N. C.	1,000.00
Dr. James F. Glenn	825.00
Dr. and Mrs. Luther L. Gobbel	500.00
Dr. Douglas M. Knight	7,500.00
E. H. Lane	1,000.00
The John and Mary R. Markle Foundation	100,000.00
Methodist Education Fund	2,001.00
Minnesota Mining and Manufacturing Company	2,000.00
National Science Foundation	193,846.80
North Carolina Conference of The Methodist Church	8,930.30
North Carolina Medical Care Commission	378,265.27
North Carolina State University	311,389.00
Dr. and Mrs. James H. Semans	1,160.00
South Carolina Conference of The Methodist Church	7,890.10

Schedule M (Continued)—Gifts for Plant and Equipment

Southeastern Jurisdictional Conference	\$	81,957.54
Estelle F. Spears		12,500.00
W. C. Stanback		2,500.00
United States Public Health Service		36,338.70
Waldensian Bakeries, Inc.		500.00
Western Electric Co.		1,036.70
Western North Carolina Conference of The Methodist Church		3,668.50
Woman's College Class of 1966		900.00
33 Other Contributors		3,658.22
		400 105 04
	\$4,	423,195.84

DUKE UNIVERSITY INVESTMENTS

as of June 30, 1966

Bonds	
Par Value	U. S. Treasury
40M	4 % Notes 8/15/66
15M	34% Notes 8/15/67 4% Bonds 10/1/69
25M	4% Bonds 10/1/09
1M $10M$	$2\frac{1}{2}\%$ Bonds $12/15/69$ 4% Bonds $8/15/70$
11M	5% Notes 11/15/70
245M	$5\frac{5}{6}$ Notes $1\frac{1}{15}$ 70 $4\frac{9}{6}$ Bonds $2\frac{15}{72}$
999.5M	3% Bonds $2/15/95$
	U. S. Government Instrumentalities
2,275M	Federal Home Loan Banks 4.35% Notes 7/25/66
4,315M	Federal Home Loan Banks 4½% Bonds 8/15/66
290M	Federal Home Loan Banks 4.95% Notes 8/25/66
560M	Federal Home Loan Banks 4.60% Notes 9/26/66 Federal Home Loan Banks 5.15% Notes 10/25/66
2,925M	Federal Home Loan Banks 5.15% Notes 10/25/66
$725M \\ 3,495M$	Federal Home Loan Banks $4\frac{1}{4}\%$ Bonds $11/15/66$ Federal Home Loan Banks $4\frac{1}{2}\%$ Bonds $1/25/67$
1,260M	Federal Home Loan Banks 5.40% Notes 2/27/67
370M	Federal Home Loan Banks 5.55% Notes 4/25/67
1,110M	Federal Home Loan Banks 4½% Bonds 9/15/67
1,850M	Federal Home Loan Banks $4\frac{1}{8}\%$ Bonds $9/15/67$ Federal Home Loan Banks $4\frac{3}{8}\%$ Bonds $3/1/68$ Federal Home Loan Banks $5\frac{3}{8}\%$ Bonds $3/25/69$
75M	Federal Home Loan Banks $5\frac{3}{8}\%$ Bonds $3/25/69$
$160\mathrm{M} \ 275\mathrm{M}$	Federal Intermediate Credit Banks 4.45% Deb. 8/1/66 Federal Intermediate Credit Banks 4.60% Deb. 9/1/66 Federal Intermediate Credit Banks 5.15% Deb. 12/1/66 Federal Intermediate Credit Banks 5.35% Deb. 1/3/67
215M	Federal Intermediate Credit Banks 4.00% Deb. 3/1/00
50M	Federal Intermediate Credit Banks 5.35% Deb. 1/3/67
100M	
180M	Federal Land Banks $4\frac{1}{4}\%$ Bonds $7/20/66$ Federal Land Banks $4\frac{1}{4}\%$ Bonds $8/21/67$ Federal Land Banks $4\frac{1}{4}\%$ Bonds $1/22/68$ Federal Land Banks $4\frac{1}{4}\%$ Bonds $1/22/68$ Federal Land Banks $4\frac{1}{4}\%$ Bonds $3/20/68$ Federal Land Banks $4\frac{3}{4}\%$ Bonds $3/20/69$ Federal Land Banks $3\frac{1}{2}\%$ Bonds $5/1/71$ Federal Land Banks $4\frac{1}{2}\%$ Bonds $2/20/74$ Federal Land Banks $3\frac{1}{2}\%$ Bonds $4/20/78$ Federal Land Banks $3\frac{1}{2}\%$ Bonds $3/20/78$
500M	Federal Land Banks $4\frac{3}{4}\%$ Bonds $8/21/67$
630M 130M	Federal Land Banks 5\frac{1}{8}\langle Bonds 1/22/68
200M	Federal Land Banks 43% Bonds 3/20/69
50M	Federal Land Banks $3\frac{1}{2}\%$ Bonds $5/1/71$
100M	Federal Land Banks $4\frac{1}{2}\%$ Bonds $2/20/74$
1,000M	Federal Land Banks $5\frac{1}{8}\%$ Bonds $4/20/78$
450M	1 cdcrar Translati Midrigage Missociation 6.00 /() Debt 6/10/01
$120M \\ 300M$	Federal National Mortgage Association 35% Deb. 3/11/68 Federal National Mortgage Association 45% Deb. 9/10/70
1,000M	Federal National Mortgage Association $4\frac{1}{8}\%$ Deb. 9/10/10 Federal National Mortgage Association 5.45% Participating Certificate
1,0001/1	4/1/77
1,000M	Federal National Mortgage Association 5.35% Participating Certificates
1,000M	4/1/79 Federal National Mortgage Association 5.40% Participating Certificates
,	6/23/79
	Other
112M	Alabama Power Co. $4\frac{1}{8}\%$ Mtge. $5/1/83$ Alabama Power Co. $3\frac{1}{8}\%$ Mtge. $3/1/84$ Alabama Power Co. $3\frac{1}{8}\%$ Mtge. $6/1/85$ Alabama Power Co. $4\frac{1}{8}\%$ Mtge. $5/1/87$ Alabama Power Co. $3\frac{1}{8}\%$ Mtge. $1/1/88$ Alabama Power Co. $4\frac{1}{8}\%$ Mtge. $5/1/89$ Allied Chemical Corp. $3\frac{1}{8}\%$ Deb. $4/1/78$ Alluminum Co. 6 Apprize $3\frac{1}{8}\%$ Deb. $4/1/78$
50M	Alabama Power Co. 3\frac{1}{8}\% Mtge. 3/1/84
75M 50M	Alabama Power Co. 32% Mtge. 6/1/85
50M	Alabama Power Co. 37% Mtge. 0/1/8/
125M	Alabama Power Co. 4% Mtge. 5/1/89
200M	Allied Chemical Corp. $3\frac{1}{2}\%$ Deb. $4/1/78$
50M	Administration Co. of America 58% Deb. 4/1/65
50M	American Can Co. $4\frac{3}{4}\%$ Deb. $7/15/90$

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Bonds
Par Value
                                          American Telephone & Telegraph Co. 23% Deb. 2/1/71
American Telephone & Telegraph Co. 34% Deb. 9/15/84
American Telephone & Telegraph Co. 43% Deb. 4/1/85
American Telephone & Telegraph Co. 33% Deb. 7/1/90
American Telephone & Telegraph Co. 43% Deb. 5/1/99
           50M
           70M
        200M
        230M
        200M
                                          Appalachian Electric Power Co. 4\frac{5}{8}\% Mtge. 12/1/83 Appalachian Electric Power Co. 4\frac{5}{8}\% Mtge. 3/1/87 Arkansas Power & Light Co. 4\frac{5}{8}\% Mtge. 2/1/93 Armeo Steel Corp. 4.35\% Deb. 4/1/84
           50M
        100M
           50M
                                          Armco Steel Corp. 4,35% Deb. 4/1/84
Armco Steel Corp. 4½% Deb. 6/1/86
Atlantic Refining Co. 3¼% Deb. 1/15/79
Automatic Canteen Co. 4¾% Deb. 7/1/81
Bell Telephone Co. Pennsylvania 4¾% Deb.
           98M
           50M
           70M
        200M
           50M
                                         Bell Telephone Co. Pennsylvania 4\frac{3}{8}\% Deb. Boston Edison Co. 4\frac{5}{8}\% Mtge. 6/1/87 C.I.T. Financial Corp. 4\frac{3}{4}\% Notes 7/5/66 C.I.T. Financial Corp. 5\frac{1}{8}\% Notes 7/25/66 C.I.T. Financial Corp. 5\frac{1}{8}\% Notes 8/30/66 C.I.T. Financial Corp. 5\frac{3}{8}\% Notes 9/28/66 C.I.T. Financial Corp. 5\frac{3}{8}\% Notes 10/11/66 C.I.T. Financial Corp. 5\frac{3}{8}\% Notes 11/14/66 C.I.T. Financial Corp. 5\frac{3}{8}\% Notes 11/28/66 C.I.T. Financial Corp. 4\frac{3}{8}\% Notes 11/28/66 C.I.T. Financial Corp. 4\frac{3}{8}\% Deb. 7/1/66 C.I.T. Financial Corp. 4\frac{3}{8}\% Deb. 9/1/70 C.I.T. Financial Corp. 4\frac{3}{8}\% Deb. 1/17/9 C.I.T. Financial Corp. 4\frac{3}{8}\% Deb. 1/15/80 C.I.T. Financial Corp. 4\frac{3}{8}\% Deb. 9/1/84 Carolina Power & Light Co. 3\frac{1}{2}\% Mtge. 10/19
                                                                                                                                                                         \% Deb. 2/1/2003
           50M
        100M
        500M
        100M
           50M
           25M
        150M
           15M
           60M
           50M
           40M
        100M
        130M
           65M
                                          Carolina Power & Light Co. 3\frac{1}{2}\% Mtge. 10/1/82 Carolina Power & Light Co. 4\frac{1}{2}\% Mtge. 11/1/91 Carolina Power & Light Co. 5\frac{1}{8}\% Mtge. 4/1/96
        125M
        100M
1,000M
                                           Central Illinois Light Co. 4\frac{5}{8}\% Mtge. 7/1/87 Central Illinois Light Co. 4\frac{7}{8}\% Mtge. 3/1/90
           50M
        100M
                                           Central Illinois Public Service Co. 33% Mtge. 9/1/77
Central Illinois Public Service Co. 43% Mtge. 1/1/89
           50M
        200M
                                           Central Power & Light Co. 4\frac{3}{4}\% Mtge. 4/1/89 Champion Paper Company 3\frac{3}{4}\% Deb. 7/15/81
        100M
           50M
           50M
                                           Chesapeake & Potomac Telephone Co. 4\frac{3}{8}\% Deb. 2/1/98
           50M
                                           Cincinnati Gas & Electric Co. 4\frac{1}{8}\% Mtge. 5/1/87
              2M
                                           City of Durham Parking Facility Revenue 34% Bond 4/1/96
           50M
                                        Columbus & Southern Ohio Electric Co. 3\frac{3}{2}\sqrt{6}\)
Commercial Credit Co. 5\frac{3}{2}\sqrt{6}\) Notes 7/26/66
Commercial Credit Co. 5\frac{3}{2}\sqrt{6}\) Notes 8/1/66
Commercial Credit Co. 4\frac{3}{2}\sqrt{6}\) Notes 8/26/66
Commercial Credit Co. 4\frac{3}{2}\sqrt{6}\) Notes 9/16/66
Commercial Credit Co. 5\frac{3}{2}\sqrt{6}\) Notes 11/7/66
Commercial Credit Co. 5\frac{3}{2}\sqrt{6}\) Notes 11/29/66
Commercial Credit Co. 5\frac{3}{2}\sqrt{6}\) Notes 12/12/66
Commercial Credit Co. 5\frac{3}{2}\sqrt{6}\) Notes 12/12/66
Commercial Credit Co. 5\frac{3}{2}\sqrt{6}\) Notes 1/3/67
Commercial Credit Co. 3\frac{3}{2}\sqrt{6}\) Notes 3/24/67
Commercial Credit Co. 3\frac{3}{2}\sqrt{6}\) Notes 3/24/67
Commercial Credit Co. 5\frac{3}{2}\sqrt{6}\) Notes 6/1/77
Commercial Credit Co. 5\frac{3}{2}\sqrt{6}\) Notes 6/1/76
Commercial Credit Co. 4\frac{3}{4}\sqrt{6}\) Notes 11/1/80
Commonwealth Edison Co. 4\frac{4}{4}\sqrt{6}\) Mtge. 3/1/8
                                           Columbus & Southern Ohio Electric Co. 3\frac{3}{4}\% Mtge. 4/1/86
        100M
           60M
           79M
974.5M
           80M
        100M
        150M
           15M
        200M
        195M
           20M
           50M
           70M
                                          Commonwealth Edison Co. 4½% Mtge. 3/1/87
Commonwealth Edison Co. 4½% Deb. 1/1/2009
Consolidated Edison Co. of N. Y. 3\frac{1}{2}\% Mtge. 2/1/83
Consolidated Edison Co. of N. Y. 3\frac{3}{8}\% Mtge. 1/1/84
           50M
           96M
           75M
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75M

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Bonds
Par Value
                                       Consolidated Edison Co. of N. Y. 3\frac{5}{8}\% Mtge. 5/1/86 Consolidated Edison Co. of N. Y. 4\frac{5}{8}\% Mtge. 10/1/86 Consolidated Edison Co. of N. Y. 4\frac{5}{8}\% Mtge. 10/1/87 Consolidated Edison Co. of N. Y. 4\frac{5}{8}\% Mtge. 11/1/91 Consolidated Edison Co. of N. Y. 4\frac{5}{8}\% Mtge. 11/1/91 Consolidated Edison Co. of N. Y. 4\frac{5}{8}\% Mtge. 10/1/92 Consolidated Natural Gas Co. 4\frac{7}{8}\% Deb. 9/1/82 Consolidated Natural Gas Co. 4\frac{7}{8}\% Deb. 2/1/86 Consolidated Natural Gas Co. 4\frac{7}{8}\% Deb. 2/1/86 Consolidated Natural Gas Co. 4\frac{7}{8}\% Deb. 4/1/88 Consolidated Natural Gas Co. 4\frac{7}{8}\% Deb. 4/1/88 Consolidated Natural Gas Co. 4\frac{7}{8}\% Deb. 4/1/88
           50M
        100M
           50M
        100M
        200M
           43M
           38M
        100M
        100M
           50M
                                        Consumers Power Co. 4\frac{1}{6}% Mtge. 8/1/86
Consumers Power Co. 4\frac{1}{2}% Mtge. 10/1/88
Consumers Power Co. 3\frac{1}{4}% Mtge. 2/1/90
Delaware Power and Light Co. 3\frac{1}{8}% Mtge. 6/1/88
           50M
           50M
       100M
           45M
           50M
                                         Detroit Edison Co. 3\frac{1}{4}\% Mtge. 5/15/80
                                        Diamond State Telephone Co. 4\frac{3}{4}\% Deb. 4/1/94
        100M
                                        Damond State Telephone Co. 4\frac{7}{8}\% Der Duke Power Co. 3\frac{8}{6}\% Mtge. 1/1/75 Duke Power Co. 2.65\% Mtge. 9/1/77 Duke Power Co. 4\frac{7}{8}\% Deb. 9/1/82 Duke Power Co. 3\frac{5}{8}\% Mtge. 5/1/86 Duke Power Co. 4\frac{1}{4}\% Mtge. 8/1/92 Duquesne Light Co. 3\frac{5}{8}\% Mtge. 9/1/83 Duquesne Light Co. 3\frac{5}{8}\% Mtge. 4/1/86 Duke Power Co. 4\frac{1}{4}\% Mtge. 4/1/86 Duke Power Co. 4\frac{1}{4}\% Mtge. 4/1/86 Duquesne Light Co. 3\frac{5}{8}\% Mtge. 4/1/86
       200M
       500M
       323M
       100M
       600M
           50M
           50M
              9M
                                         Durham Investment Corp. 5% Deb. 12/31/77
       2.5M
                                        Florida East Coast Railway Co. 5\% Mtgc. 1/1/2011 Florida East Coast Railway Co. 5\frac{1}{2}\% Mtgc. 1/1/2011
       2.5M
           50M
                                        General Electric Co. 3\frac{1}{2}\% Deb. 5/1/76
                                       General Electric Co. 3\frac{1}{2}\% Deb. 5/1/76
General Motors Acceptance Corp. 5\frac{1}{3}\% Notes 7/1/66
General Motors Acceptance Corp. 4\frac{1}{3}\% Notes 7/29/66
General Motors Acceptance Corp. 4\frac{1}{3}\% Notes 8/22/66
General Motors Acceptance Corp. 5\frac{1}{3}\% Notes 8/22/66
General Motors Acceptance Corp. 5\frac{1}{3}\% Notes 8/30/66
General Motors Acceptance Corp. 4\frac{1}{3}\% Notes 9/16/66
General Motors Acceptance Corp. 4\frac{1}{3}\% Notes 9/23/66
General Motors Acceptance Corp. 5\frac{1}{4}\% Notes 10/10/66
General Motors Acceptance Corp. 3\frac{1}{3}\% Deb. 7/15/69
General Motors Acceptance Corp. 4\frac{1}{3}\% Deb. 9/15/72
General Motors Acceptance Corp. 4\frac{1}{3}\% Deb. 9/1/82
General Motors Acceptance Corp. of Canada, Ltd. 4\frac{1}{3}\%
           25M
       100M
       400M
       200M
       121M
455.5M
       125M
          15M
       100M
       125M
       100M
                                        General Motors Acceptance Corp. of Canada, Ltd. 4\frac{3}{4}\% Deb. 1/15/68 General Motors Acceptance Corp. of Canada, Ltd. 4\frac{3}{4}\% Deb. 12/15/69
       150M
          50M
                                        General Motors Aceptance Corp. of General Motors Corp. 3\frac{1}{4}\% Deb. 1/1/79 Georgia Power Co. 3\frac{2}{3}\% Mtge. 7/1/82 Georgia Power Co. 3\frac{2}{4}\% Mtge. 4/1/83 Georgia Power Co. 3\frac{2}{8}\% Mtge. 4/1/84 Georgia Power Co. 3\frac{2}{8}\% Mtge. 5/1/85 Georgia Power Co. 3\frac{2}{8}\% Mtge. 4/1/86 Georgia Power Co. 5\frac{2}{1}\% Mtge. 6/1/87
       150M
       100M
          55M
       100M
          75M
           50M
                                        Georgia Power Co. 5\frac{1}{4}\% Mtge. 6/1/87
           32M
       100M
                                        Greatamerica Corporation 4% Deb. 4/1/85
                                        Gulf States Utilities Co. 3\frac{1}{8}\% Mtge. 12/1/82 Gulf States Utilities Co. 3\frac{1}{8}\% Mtge. 12/1/83 Gulf States Utilities Co. 4\frac{1}{8}\% Mtge. 10/1/87 Gulf States Utilities Co. 4\frac{1}{8}\% Mtge. 1/1/89 Gulf States Utilities Co. 5\frac{1}{4}\% Mtge. 12/1/89
          50M
       100M
          50M
       200M
       100M
          50M
                                        Honeywell, Inc. 3\frac{3}{4}\% Deb. 8/1/76
          75M
                                        Houston Lighting & Power Co. 4\frac{3}{4}\% Mtge. 11/1/87
          95M
                                        Idaho Power Co. 4\frac{1}{2}\% Mtge. 10/15/88
       100M
                                        Illinois Bell Telephone Co. 4\frac{3}{8}\% Mtge. 3/1/94
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	Bonds	
F	Par Value	
	100M	Illinois Power Co. $3\frac{1}{4}\%$ Mtge. $11/1/83$ Illinois Power Co. $3\frac{3}{4}\%$ Mtge. $7/1/86$ Illinois Power Co. $4\frac{9}{6}\%$ Mtge. $5/1/88$
	50M	Illinois Power Co. $3\frac{3}{4}\%$ Mtge. $7/1/86$
	50M	Illinois Power Co. 4% Mtge. 5/1/88
	50M	Imperial Util Ltd 3%% Deb 2/1/75
	50M	Inland Steel Co. $3\frac{1}{2}\%$ Mtge. $7/1/81$
	46M	Inland Steel Co. $4\frac{3}{3}\%$ Mtge. $7/1/87$
	177M	Inland Steel Co. $3\frac{1}{2}\%$ Mtge. $71/81$ Inland Steel Co. $4\frac{1}{3}\%$ Mtge. $71/87$ Inland Steel Co. $4\frac{1}{2}\%$ Mtge. $2/1/87$ Iowa Illinois Gas & Electric Co. $4\frac{1}{3}\%$ Mtge. $5/1/91$
	99M	Iowa Illinois Gas & Electric Co. $4\frac{7}{5}\%$ Mtge. $5/1/91$
	100M	Kansas City Power & Light Co. 3 ² % Mtge, 1/15/83
	75M	Long Island Lighting Co. 3\frac{3}{4}\% Mtge. 10/1/82 Long Island Lighting Co. 3\frac{1}{4}\% Mtge. 12/1/84 Long Island Lighting Co. 4\frac{1}{8}\% Mtge. 5/1/88
	125M	Long Island Lighting Co. 3½% Mtge. 12/1/84
	100M	Long Island Lighting Co. $4\frac{1}{8}\%$ Mtge. $5/1/88$
	98M	P. Lorillard Co. $3\frac{3}{4}\%$ Deb. $4/1/78$ P. Lorillard Co. $4\frac{3}{5}\%$ Deb. $6/1/86$
	100M	P. Lorillard Co. $4\frac{7}{8}\%$ Deb. $6/1/86$
	50M	Louisville Gas and Electric Co. 4\(\frac{1}{2}\)% Mige. 9/1/8\(\text{1}\)
	100M	May Department Stores Co. $3\frac{1}{4}\%$ Deb. $2/1/78$ Michigan Bell Telephone Co. $4\frac{3}{8}\%$ Deb. $12/1/91$
	250M	Michigan Bell Telephone Co. $4\frac{3}{8}\%$ Deb. $12/1/91$
	60M	Michigan Bell Telephone Co. $4\frac{3}{4}\%$ Deb. $11/1/92$
	100M	Monogahela Power Co. 43% Mtge. 4/1/84
	50M	Montana Power Co. $2\frac{2}{8}\%$ Mtge. $10/1/75$
	200M	Montana Power Co. $4\frac{1}{2}\%$ Mtge. $4/1/89$
1	,500M	Morgan Guaranty Trust Co. of N. Y. 5% Negotiable Certificates of
_	0007.5	Deposit 7/25/66
1	,000M	Morgan Guaranty Trust Co. of N. Y. 5\frac{1}{8}\% Negotiable Certificates of
	70035	Deposit 10/14/66
	700M	Morgan Guaranty Trust Co. of N. Y. 5½% Negotiable Certificates of
	180M	Deposit 12/27/66 Neurotin States Telephone & Teleproph Co. 1307 Deb. 2/1/88
	60M	Mountain States Telephone & Telegraph Co. $4\frac{3}{8}\%$ Deb. 2/1/88 National Steel Corp. $3\frac{7}{8}\%$ Mtge. $11/1/86$
	50M	National Steel Colp. 58/0 Mige. 11/1/00
	100M	Now England Tower Co. 5470 Mtgc. 1/1/00
	100M	New England Power Co. 3½% Mtge. 1/1/85 New England Power Co. 4¾% Mtge. 11/1/91 New England Telephone & Telegraph Co. 3¼% Deb. 12/15/77 New England Telephone & Telegraph Co. 3½% Deb. 12/15/88
	50M	New England Telephone & Telegraph Co. 34% Deb. 12/15/88
	125M	New Jersey Bell Telephone Co. $3\frac{2}{8}$ Deb. $4/1/93$
	60M	New York State Electric & Gas Corp. 38% Mtge. 9/1/85
	100M	New York Telephone Co. $4\frac{1}{2}\%$ Mtge. $5/15/91$
	50M	New York Telephone Co 3307 Mtge 4/1/96
	75M	Niagara Mohawk Power Corp. $3\frac{1}{2}\%$ Mtge. $2/1/83$ Niagara Mohawk Power Corp. $3\frac{1}{2}\%$ Mtge. $5/1/86$ Niagara Mohawk Power Corp. $4\frac{7}{8}\%$ Mtge. $9/1/87$ Niagara Mohawk Power Corp. $4\frac{7}{8}\%$ Mtge. $9/1/87$ Niagara Mohawk Power Corp. $3\frac{7}{8}\%$ Mtge. $6/1/88$ Northern Indiana Public Service Co. $4\frac{1}{2}\%$ Mtge. $1/15/89$
	50M	Niagara Mohawk Power Corp. 35% Mtge. 5/1/86
	50M	Niagara Mohawk Power Corp. 470% Mtge. 9/1/87
	50M	Niagara Mohawk Power Corp. 37% Mtge. 6/1/88
	100M	Northern Indiana Public Service Co. 4½% Mtge. 1/15/89
	48M	Northern States Power Co. 45% Mtge. 6/1/87
	200M	Northwestern Bell Telephone Co. 4\frac{3}{2}\sigma_6 Deb. 3/1/2003
	65M	Ohio Edison Co. $3\frac{1}{4}\%$ Mtge, $1/1/84$ Ohio Edison Co. $4\frac{1}{2}\%$ Mtge, $4/1/89$ Ohio Power Co. $3\frac{2}{8}\%$ Mtge, $1/1/83$ Ohio Power Co. $4\frac{1}{4}\%$ Mtge, $1/1/86$ Ohio Power Co. $4\frac{1}{8}\%$ Mtge, $4/1/89$
	150M	Ohio Edison Co. $4\frac{1}{2}\%$ Mtge. $4/1/89$
	125M	Ohio Power Co. $3\frac{3}{8}\%$ Mtge. $1/1/83$
	50M	Ohio Power Co. 4\frac{1}{4}\% Mtge. 11/1/86
	200M	Ohio Power Co. $4\frac{5}{8}\%$ Mtge. $4/1/89$
	120M	Pacific Gas & Electric Co. 3\frac{1}{8}\% Mtge. 6/1/84
	35M	Pacific Gas & Electric Co. 3 % Mtge. 6/1/84 Pacific Gas & Electric Co. 4½ % Mtge. 12/1/86 Pacific Gas & Electric Co. 3 % Mtge. 12/1/88 Pacific Gas & Electric Co. 5 % Mtge. 6/1/89
	50M	Pacific Gas & Electric Co. 3\frac{3}{8}\% Mtge. 12/1/88
	50M	Pacific Gas & Electric Co. 5% Mtge. 6/1/89
	100M	Pacific Telephone & Telegraph Co. $3\frac{1}{4}\%$ Deb. $11/15/79$
	50M	Pacific Telephone & Telegraph Co. $5\frac{1}{8}\%$ Deb. $8/1/80$
	250M	Pacific Telephone & Telegraph Co. $4\frac{3}{8}\%$ Deb. $8/15/88$
	150M	Pacific Telephone & Telegraph Co. $3\frac{1}{8}\%$ Deb. $11/15/89$
	200M	Pacific Telephone & Telegraph Co. $3\frac{1}{4}\%$ Deb. $11/15/79$ Pacific Telephone & Telegraph Co. $5\frac{1}{8}\%$ Deb. $8/1/80$ Pacific Telephone & Telegraph Co. $4\frac{3}{8}\%$ Deb. $8/15/88$ Pacific Telephone & Telegraph Co. $3\frac{1}{8}\%$ Deb. $11/15/89$ Pacific Telephone & Telegraph Co. $4\frac{3}{8}\%$ Deb. $11/190$

26

American Educational Life Ins. Co.

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Bonds
Par Value
     100M
                         Pennsylvania Power & Light Co. 4\frac{5}{8}\% Mtge. 12/1/91
                         Philadelphia Electric Co. 3\frac{3}{3}\% Mtge. 4/1/85
Phillips Petroleum Co. 4\frac{1}{3}\% Conv. Deb. 2/15/87
     115M
       20M
                         Pillsbury Mills, Inc. 3\frac{1}{8}\% Deb. 12/1/72
     100M
       50M
                         Plantation Pipe Line Co. 3\frac{1}{2}\% Deb. 4/1/86
                         Province of Ontario, Canada 3½% Deb. 9/1/72
Province of Ontario, Canada 3½% Deb. 2/1/75
Province of Ontario, Canada 3½% Deb. 3/15/80
Province of Ontario, Canada 4½% Deb. 2/1/84
      60M
     200M
       75M
     200M
                         Public Service Co. of Indiana, Inc. 3% Mtge. 1/1/84
Public Service Co. of Indiana, Inc. 4% Mtge. 2/1/89
Public Service Electric & Gas Co. 3½ Mtge. 5/1/84
Public Service Electric & Gas Co. 45% Mtge. 8/1/88
      55M
    200M
      50M
     200M
     191M
                         San Diego Gas & Electric Co. 4\frac{5}{8}\% Deb. 1/15/84
                         Scarsdale Golf Club, Inc. 4\% Bonds 12/1/74 Sinclair Oil Corp. 4\frac{3}{8}\% Conv. Deb. 12/1/86
        .3M
      30M
                        Southern Bell Telephone & Telegraph Co. 4\% Deb. 10/1/83 Southern Bell Telephone & Telegraph Co. 4\frac{5}{8}\% Deb. 12/1/93 Southern Bell Telephone & Telegraph Co. 4\frac{5}{8}\% Deb. 3/1/98
      50M
    150M
    100M
                        Southern Bell Telephone & Telegraph Co. 4\frac{2}{3}\% Deb Southern California Edison Co. 3\frac{2}{3}\% Mtge. 8/15/78 Southern California Edison Co. 3\frac{2}{3}\% Mtge. 4/15/81 Southern California Edison Co. 4\frac{2}{3}\% Mtge. 2/15/82 Southern California Edison Co. 4\frac{2}{3}\% Mtge. 9/1/82 Southern California Edison Co. 4\frac{2}{3}\% Mtge. 9/1/82 Southern California Edison Co. 4\frac{2}{3}\% Mtge. 9/1/85 Southern California Edison Co. 4\frac{2}{3}\% Mtge. 9/1/86 Southern California Edison Co. 4\frac{2}{3}\% Mtge. 5/15/88 Southern California Edison Co. 5\frac{2}{3}\% Mtge. 5/15/91 Southern California Gas Co. 3\frac{2}{3}\% Mtge. 6/1/81
      50M
      59M
      40M
      48M
      50M
      75M
    100M
      70M
1,000M
                         Southern California Gas Co. 37% Mtge. 6/1/81
    100M
                         Southern New England Telephone & Telegraph Co. 3\frac{1}{8}\% Deb. 3/1/78
      50M
                         Sterling Drug Co., Inc. 3\frac{1}{4}\% Deb. 4/1/80 Superior Oil Co. 3\frac{3}{4}\% Deb. 7/1/81
      50M
      50M
      50M
                         Tampa Electric Co. 41% Mtge. 7/1/88
      32M
                         Tennessee Gas Transmission Co. 6% Deb. 11/1/77
                         Union Electric Co. 3\frac{3}{4}\% Mtge. 7/1/86 Union Electric Co. 4\frac{3}{8}\% Mtge. 3/1/88
      50M
    100M
                        United States Steel Corp. 4\% Deb. 7/15/83
United States Steel Corp. 4\frac{1}{2}\% Deb. 4/15/86
Utah Power & Light Co. 3\frac{1}{2}\% Mtge. 10/1/82
      50M
    200M
      50M
    100M
                         Vendo Co. 4\frac{1}{2}\% Deb. 9/1/80
                        Virginia Electric & Power Co. 4\frac{1}{8}\% Mtge. 10/1/86 Virginia Electric & Power Co. 4\frac{1}{2}\% Mtge. 12/1/87 Virginia Electric & Power Co. 4\frac{1}{8}\% Mtge. 6/1/91 Washington Water Power Co. 4\frac{1}{8}\% Mtge. 7/1/87
      50M
    100M
    100M
      50M
      50M
                         West Penn Power Co. 4\frac{7}{8}\% Mtge. 7/1/87
                         West Virginia Pulp & Paper Co. 4% Deb. 1/1/78
      25M
                         Wisconsin Electric Power Co. 3\frac{7}{8}\% Mtge. 4/15/86 Wisconsin Power & Light Co. 4\frac{5}{8}\% Mtge. 3/1/89
      50M
    100M
      50M
                         Wisconsin Telephone Co. 4\frac{1}{2}\% Deb. 7/1/92
    Stocks
No. of Shares
    3,000
                      Addressograph-Multigraph Corp.
                      Alleghany Power System, Inc.
  10,626
  25,000
                      Alcan Aluminium, Ltd.
    6,000
                      Amerada Petroleum Corp.
  22,600
                      American Cyanamid Co.
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	Duke University Investments (C
Stocks	
No. of Sh	ares
412	American Electric Power Co.
26,229	American Telephone & Telegraph Co.
5,000	American Tobacco Co.
11,500	Ampex Corp.
2,000	Arkansas-Louisiana Gas Co.
8,000	Avco Corp.
18,000	Baltimore Gas & Electric Co.
5,000	Bristol-Myers Co.
100	Business Development Corp. of North Carolina
7,000	Campbell Soup Co.
1,505	Cannon Mills Co.
2,605	Cannon Mills Co. B
4,000	Canteen Corporation
6,010	Carolina Power & Light Co.
693	Carolina Telephone & Telegraph Co.
16	Central Engineering & Contracting Corp.
3,978	Chase Manhattan Bank
10,000	Chemical Bank New York Trust Co.
2,532	Cincinnati Gas & Electric Co.
7,200	Coca-Cola Co.
11,409	Commonwealth Edison Co.
10,400	Consolidated Edison Co. of N. Y.
10,028	Consumers Power Co.
10,000	Container Corp. of America
4,000	Control Data Corporation 4% Conv. Pfd.
3,000 800	Continental Oil Co. Corn Products Co.
4,000	Cummins Engine Co.
15,189	Dayton Power & Light Co.
10,109	Denny Roll & Panel Co.
5,000	Detroit Edison Co.
5,100	The Dow Chemical Co.
157,200	Duke Power Co.
2,000	E. I. DuPont de Nemours & Co.
600	Durham Investment Corp.
18,060	Eastman Kodak Co.
7,000	F.M.C. Corporation
5,000	Fidelity Philadelphia Trust Co.
10,716	First National Bank of Boston
15,464	First National City Bank of N. Y.
160	Florida East Coast Railway Co.
11,000	General Electric Co.
3,000	General Foods Corp.
3,670	General Motors Corp.
3,336	General Motors Corp. \$5.00 Pfd.
4,500	General Telephone & Electronics Corp.
2,000	Georgia Pacific Corp. \$1.64 Conv. Pfd.
13,000	Gillette Co.
9,852	Gulf Oil Corp.
8,483	Hanes Corporation
7,000 11,800	Honeywell, Inc.
1,500	Indianapolis Power & Light Co. Ingersoll Rand Co.
900	Inland Steel Co.
13,957	International Business Machine Corp.
1,000	International Harvester Co.
6,200	International Nickel Co. of Canada, Ltd.
2,640	International Paper Co.
,	

S	toc	ks	
No.	of	Shares	

8,000 International Telephone & Telegraph Corp.

5,555 J. B. Ivey & Co.

- Jefferson Standard Life Insurance Co. 3,351 J. A. Jones Construction Co. 5\% Pfd. 15
- 13,400 Kansas City Power & Light Co. Lanvin-Charles of The Ritz, Inc. 5,000 500 Liggett & Myers Tobacco Co.

Link Belt Co. 3,000

1,000 Litton Industries, Inc. A Pfd.

7,000 Lockheed Aircraft Corp.

Long Meadow Farms Cooperative Inc. 5% Pfd. 30

Louisiana Land & Exploration Co. 15,800

The Magnavox Co. 6,000

Manufacturers Hanover Trust Co. 6,670

8,000 Maryland Cup Corp.

10,500 Merck & Co.

12,000 Middle South Utilities, Inc.

4,000 Minnesota Mining & Manufacturing Co.

Mobil Oil Corp. 10,000

10,828 Monsanto Co.

12,000 Morgan Guaranty Trust Co. of N. Y.

5,000 National Cash Register Co.

7,000 National Lead Co.

9,856 New York State Electric & Gas Corp.

10,950 North Carolina National Bank

22,800 Ohio Edison Co.

10,000 Owens Illinois Glass Co. 14,600 Pacific Gas & Electric Co.

200 Pacific Lighting Corp. \$4.36 Pfd.

Pamlico Power & Light Co. 5% Pfd. 2,500 Pepsi Co, Inc.

2,000 The Permian Corp.

15,436 Philadelphia Electric Co.

6,100 Procter & Gamble Co.

101,600 R. J. Reynolds Tobacco Co. B 35,909 Rowe Price New Horizons Funds

Scott Paper Co. 12,000

300 Security Life & Trust Co.

Shell Oil Co. 440

8,000 The Southern Co.

340 Spindale Mills, Inc.

400 Standard Oil Co. of Indiana 20,989 Standard Oil Co. of New Jersey

32,799 Texaco, Inc.

1,000 Texas Eastern Transmission Corp. 5% Pfd.

3,000 Texas Instruments, Inc. 2,000

- Union Carbide Corp. 5,000 Wachovia Bank & Trust Co.
- Warner-Lambert Pharmaceutical Co. 6,000

GIFTS AND BEQUESTS

Duke University derives its principal support from endowment funds and from miscellaneous gifts and grants. Permanently invested capital funds enable the University to offer to students academic and professional training at a fraction of its actual cost. The effectiveness of the University is determined to a large extent by its financial resources.

Gifts and bequests devoted to the improvement of the work of the University will be received and administered by the Trustees in accordance with the desires of the donor.

GIFTS. Any kind of property, real or personal, may be the subject of a gift and only such form as is required to pass title is necessary. If the gift consists of real property, the title will be passed by deed; if it consists of cash or unregistered bonds, the gift is consummated by delivery of the property; or if stocks, by delivery of properly endorsed stock certificates. Unless restricted, the use of gifts is at the discretion of the Board of Trustees. Usually the proceeds, conservatively invested, are added to the permanent endowment of the University. The donor may, however, restrict the use of any gift and designate definitely the object for which it shall be used. In such cases, the transfer of property should be accompanied by a letter or other document describing in detail the objects for which the proceeds of the gift are to be used and when accepted by the University the terms or conditions set out therein become binding upon it.

BEQUESTS. Bequests may be made to the University by an appropriate clause inserted in a will or by codicil to a will already drawn. The forms shown on the following page will serve as appropriate clauses for wills or codicils.

FORMS FOR BEQUESTS

General

General
I give, devise and bequeath to Duke University, a corporation existing under the laws of the State of North Carolina and located in the City and County of Durham, State of North Carolina, and its successors forever, the sum of
(or otherwise describe the gift) for the general purposes and uses of the University
at the discretion of the Board of Trustees.
Specific
I give, devise and bequeath to Duke University, a corporation existing under
the laws of the State of North Carolina and located in the City and County of
Durham, State of North Carolina, and its successors forever, the sum of

Codicil

(or otherwise describe the gift) and direct that the income therefrom shall be used

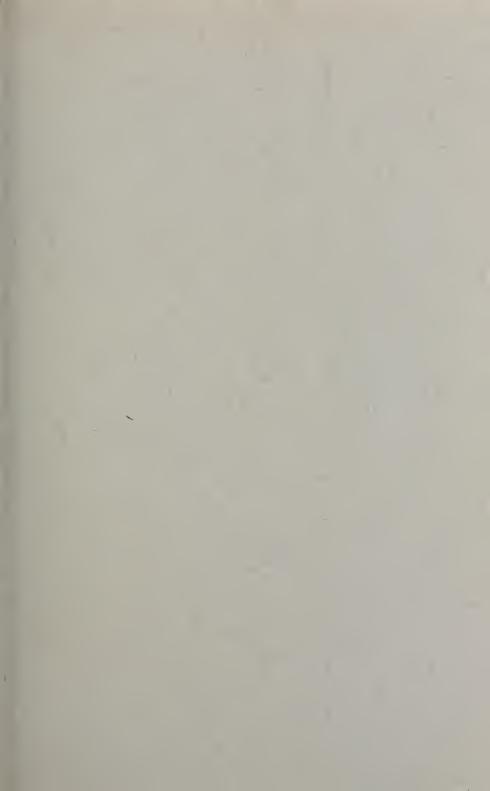
for the following purposes, viz. (here describe in detail the use desired).

Having hereinbefore made my last Will and Testament dated
and being of sound mind, I hereby
make, publish, and declare the following codicil thereto; (here insert clause in
same form as if it had been included in body of Will). Except as hereinbefore
changed, I hereby ratify, confirm and republish my said last Will and Testament.

(It is strongly recommended that a competent lawyer be employed to prepare the will and to supervise its execution in order to comply with all the requirements of the law of the state in which the maker of the will resides. It is also wise to give the University considerable latitude in the use of any fund so that a change of circumstances may not impair the usefulness of the gift. The Treasurer of the University will be glad upon request to review the phrasing of any proposed form of bequest.)

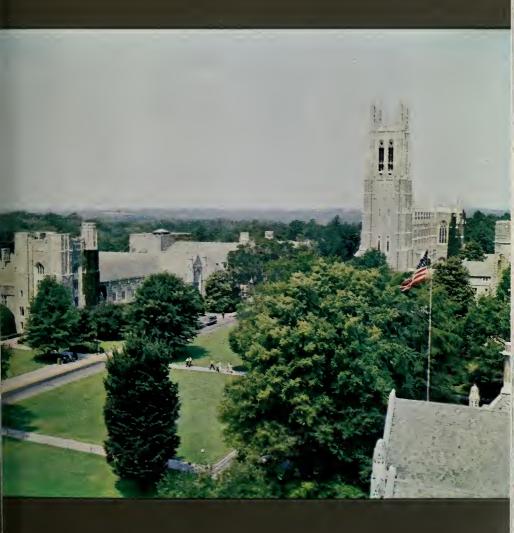








STUDYING LAW AT DUKE



BULLETIN OF DUKE UNIVERSITY

"I have selected Duke University as one of the principal objects of this trust because I recognize that education, when conducted along sane and practical, as opposed to dogmatic and theoretical, lines, is, next to religion, the greatest civilizing influence. I request that this institution secure for its officers, trustees and faculty men of such outstanding character, ability and vision as will insure its attaining and maintaining a place of real leadership in the educational world, and that great care and discrimination be exercised in admitting as students only those whose previous record shows a character, determination and application evincing a wholesome and real ambition for life. And I advise that the courses at this institution be arranged, first, with special reference to the training of preachers, teachers, lawyers and physicians, because these are most in the public eve, and by precept and example can do most to uplift mankind, . . ."

(From the Indenture of James B. Duke)

Studying Law at Duke



The Duke Chapel, in the heart of the Gothic Campus, is an outstanding monument of its kind.

Bulletin of Duke University 1965-1967

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Number 1

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The Study of Law?

If you have ambition, intelligence and confidence in your ability to succeed, probably you have already thought of studying law, especially if you aspire to rewards beyond those merely financial. Few careers offer greater satisfaction than success in the law.

The study of law is *not* for those seeking great wealth with little effort. It is a career for those of superior

ability and character who are willing to reap in proportion to their efforts.

If law is taught in the "grand manner," it provides a liberal education, one that cuts across so many fields of human activity and human relations that those who pursue it may approach that Renaissance ideal of the "Universal Man."

The study of law leads to many diverse opportunities. For some ca-



The spot-lighted Chapel at night is a dramatic and inspiring sight.

Turn this page for a look at a typical Duke Law School entering class.

(We try to limit entering classes to 100 students, but this one had a few more.)

33% from the northeastern states

30% from the southern states

26% from the middle western states

11% from the far western states

reers it is the means of entry. For others it is a stepping stone to more rapid advancement.

Perhaps already you have decided to practice law, or perhaps you are seeking a career in government, with a large corporation or in a family owned business, in education or in communications. Duke law graduates include leaders in all of these fields.

If YOU like to help people, if you can be constructive in dealing with problems, troubles, and dilemmas, then you may do well to consider the law as a profession. Helping people is a lawyer's daily work, solving problems his professional responsibility, and trouble the reason for his existence.

Law offers opportunities to people of varied talents, so heterogeneous is its practice. You may have no talent for courtroom dramatics, and yet you may succeed as a tax specialist, estate planner, or organizational strategist.

If you are excellent at written argument but less adept at oral argument, you can still fit effectively into a partnership team. There are many different kinds of practices and specialities. Civil and criminal litigation, corporation law, estate law, taxation and labor relations are but a few. There are many sizes of law offices from the one-man office to those with over one hundred lawyers. If you possess the basic qualifications, then somewhere there is a place that will suit your temperament and ability.

A good lawyer will find his earnings growing each year. Unlike other pursuits, where peak earning power may be reached at the age of 35, a lawyer will find his earnings much greater at 45, better still at 55, and still growing at 65, if he chooses to remain active.

Yes, the legal profession offers you a challenge and a great opportunity. Duke University School of Law offers a chance to seek and meet that opportunity.







Moot court trials give practice in courtroom give and take.

Do You Have

A Lawyer's Qualifications?

Some of the qualities that a lawyer must possess have already been touched upon. There are others.

"Talk, talk, talk! Why, this boy talks so much that, I declare, he ought to be a lawyer." This is a crude conception, unfortunately all too prevalent, of the qualifications for a lawyer. Members of the profession are apt to overhear such remarks with mingled amusement and resentment.

True, if you are going to be a lawyer you should be articulate, but this does not mean garrulous. You should be articulate with pen as well as with the spoken word. The law is no profession for the illiterate. The ability to express oneself with a few intelligently chosen words, selected after solid analysis and grammatically and artistically presented, is a great asset. This involves the ability to read intelligently, because a lawyer constantly turns to legal literature (and non-legal as well) for information and ideas. A limited vocabulary is a handicap.

It is needless to say that another prime requisite is the ability to think clearly.

Every leading lawyer with whom you will ever talk will also emphasize this point: character and integrity lead the list of virtues that a lawyer must possess. The young lawyer from the very beginning must so conduct himself that no breath of suspicion can be associated with his conduct. He will be observed by everyone, and in particular by other lawyers. One wrong ethical move at the start of his career and he is immediately pigeonholed as a man to bear watching, not to be trusted. Such a reputation is a tremendous handicap to success and satisfaction in any field, and particularly so in law. One of the lawyer's greatest assets is his ability to inspire confidence. When a client leaves the office, that client should say to himself: "I know that my problem is in honest, capable and conscientious hands."

Naturally, personal appearance, dress, speech and manners have a definite bearing on inspiring confidence.

Finally, you should know that the willingness and ability to work hard is essential. If you aspire to the 25-hour week, don't be a lawyer. For one thing, no respectable lawyer would want to work that little—law practice is too interesting. Good, solid, hard work counts for more in the long run than occasional flashes of genius. If, on assessing yourself, you conclude that you are not "brilliant," that does not necessarily mean that you cannot be a successful lawyer. Many a "genius" has been surpassed in the practice of law by others less brilliant but with more of the prosaic virtues, including plain horse sense and good judgment.



The members of last year's National Moat Court team, runners-up in the national competition, are congratulated by Mr. Justice Clark. Left to right: Charles Boteman, William Lear, Mr. Justice Tom C. Clark, James Maxwell.

Prepare for Law School?

What college courses should you take if you are going to law school?

One can point to no single course in college and say that *that* is a "must" in pre-law study. Nor can one say that there is any single "major" which opens the way for success in law study or law practice. Success has been achieved in law school and in law practice by students who have majored in mathematics, English, history, economics, philosophy, political science, Latin, foreign languages, the physical sciences, and even those with degrees in engineering or business administration.

In general, if you are going to law school, you can afford to pass up those courses which include the word "law" in their names, but this statement does not apply to college courses in constitutional law or international law when studied from the point of view of the political scientist.

Take the tough courses in college, those that make you think and work. Avoid the "snap" courses.

In general, avoid the "vocational" courses. Stick to the fields which traditionally have been looked upon as the mark of the educated man. You will recognize them among those fields already mentioned, although they are by no means limited to those fields. Mathematics encourages you to think logically. English courses should help you to become

An entrance to the Law Building, classroom wing on left, library wing on right.





Section of Library Reading Room, Law Building.

articulate and literate—especially, some say, the English writing courses. Latin and modern languages instill discipline and accuracy—and incidentally teach you a great deal about your own language. History, putting you in contact with the culture and achievements of the ages, enables you to understand your heritage and assess current institutions. Philosophy challenges you to inquire, question, speculate. Political science, economics and sociology broaden your horizon, make you better able to appreciate the world in which you live. None of these subjects will make you a technician who, as such, can sell his services for a higher price. But you will be a better practitioner in the learned professions for having chosen them over the vocational courses. (Accounting, properly taught can well be part of a liberal education; moreover, it is especially helpful in courses such as corporations and taxation.)

Selecting Your Law School

Any attempt to classify law schools in inherently arbitrary and is bound to be far from definitive. It is, however, customary to regard the better schools as either "national" or "state" and as large or small. This disregards those unaccredited schools, not affiliated with any strong university, which frequently are operated merely as profit-making ventures and do not merit your consideration. In this connection it should be emphasized that law is a profession in which only the superior practitioner stands a high chance of success, and you should not handicap yourself with an inferior legal education.

A national law school is one whose student body is not predominantly from the state in which it is located. This in turn means that the sphere of the school extends beyond the state. A by-product is that its graduates are pretty well scattered over the nation.

The Duke Law School is in the "national" group and, accordingly, its instruction is directed to the legal principles that underlie what lawyers and judges do in all sections of our country and elsewhere in the common law world, i.e., the British Commonwealth. (And often in other countries.) One might be led to believe that a local law school better prepares its students for success in local law practice. Actually, the evidence does not support such belief. One advantage of the national law school is that its graduates enjoy a wide market when it comes to making professional connections upon graduation.

The distinction between the "large" and the "small" law school relates mainly to the number of law students. Each type of school has certain advantages. The mass production and cold impersonality of the large schools, it can be argued, provide good preparation for what you can expect in our mass urban civilization. Arguably, students at such a school learn from each other by a cross-fertilization of many minds. In fact, however, a student gets to know only a few other students at such a place and they tend to form small groups; the cross-fertilization, except in the class room, is thus within a very limited group after all. And in the large class room, the students at the back of the room may get very little benefit from a discussion going on between the professor and a student in the front row. In the smaller law school, you get to know every man in your class and frequently most of



The dean constregularly with ex student—here above employment oppor nities, but often above many other thin



A Duke professor's door is olways open to his students. Professor Lowndes, notionally known tax low expert, cleors a point for student.

the students in the other classes—or at least you get the chance to do so if you make the effort. You feel free to start a legal argument any time, with any one of them. In the smaller law school you can get to know your professors; your professors can get to know you.

You can acquire a very good legal education at either a top-flight large school or a top-flight small school. It is largely a question of suit-

ing your taste and temperament.

One warning to you, however: Discount the lavish praise that you will always hear of each and every law school within a radius of a few miles from its location! For some inexplicable reason an intense provincialism exists with respect to law schools. You will be solemnly told, within this radius, that here is the greatest law school in the world, or at the least it may be grudgingly conceded that it is number two. If you ask a lawyer, he will tell you that the institution which he attended is the greatest of them all. Lawyers can be helpful to you in your selection of a law school if you will just make it clear to them that their alma mater is to be left out of the discussion.

After Duke Law School, Then What?

Placements of its students is one of Duke Law School's most successful achievements. Close contact is kept by the Dean and the Assistant Dean with outstanding law firms over the country.

Notwithstanding the many other opportunities available to Duke Law students upon graduation, they seem to prefer the private practice of law. Their preferences in this respect run to the law firms in the larger cities of the nation and include all major geographical areas. The national distribution of the School's graduates in large measure reflects the wide geographical sources of the incoming students.

Naturally, a student who stands high in his class finds himself in more of a "seller's market" than one who stands low, other factors being equal. (Which they never are.) Even so, we are constantly gratified at how far down a Duke Law School class the top flight law firms of every region are willing to go for young and promising legal talent.

Spencer Berne Smith

Camp Hill, Pennsylvania. Born July 7, 1940. Single

SCHOLASTIC BACKGROUND AND DISTINCTIONS: A.B. History, Callege of Wooster, 1962. Distinctions: Dean's List; Phi Beta Kappa; Phi Alpha Theta; scholarship; William Brown Memorial Prize in History, Activities President of social fraternity; secretary of the Man's Association; Congressional Club; chairman, Student Committee on Church and College Relations, Religion-in-Life Committee; President Phi Alpha Theta.

Law School: Distinctions: scholarship: Duke Law Journal, Editorial Board. Activities: Phi Alpha Delto; Duke Bar Association.

EMPLOYMENT 8ACKGROUND: Low clerk, Landis & McIntash; law clerk, McNees, Wallace & Nurick; summer service project in New Mexica for Board of Christian Education of Preshyterian Church; School Business Services, Department of Public Instruction, School Audit, Auditor General Department; comp employee, Buck Hill Falls.

CAREER PLANS: A law firm, small to medium size and having a general practice, pre-ferably in Pennsylvania

MILITARY STATUS: Non-veteran



Ross Jordan Smyth

Charlotte, North Carolina. Born August 21, 1936. Married.

SCHOLASTIC BACKGROUND AND DISTINCTIONS: A.B. English, Davidson College, 1958. Distinctions: Phil Bota Kappa; Comicron Delta Kappa; Sobbard and Blade; Who's Who is American Colleger and Universities; Union Corbide Scholarship. Activities: Secretory-Treasurer. 1st Vice-President, President of Student Body, ROTC, Regimental Executive Officer, SAE traternity, Rush Chairman, soccer team, captain.

Law School: Distinctions: scholarship; Duke Law Journal, Casenote Editor. Activities: Phi Delta Phi, Clerk; Duke Bar Association

EMPLOYMENT BACKGROUND: Summer jobs. A & P. warehouse, manual lobar; National Carbon Company, control lob assistant. April 1960-September 1962; North Carolina National Bank, Manugement trainee, administrative assistant to the President

CAREER PLANS: Any size firm in North Carolina, preferably Charlotte.

MILITARY STATUS: Commissioned 2d Lr. 1958. Six months active duty. Present status, Captain, N. C. Notional Guard. Present obligation, weekly driffs and two weeks active duty in summer. Obligation expires June 2, 1966.





Principal participants in the Low Doy-Dedication exercises: Provost R. Taylor Cole; Professor Walter Gellhorn, President of the Association of American Law Schools; Mr. Charles S. Rhyne, former President, American Bor Association; Chief Justice Earl Warren; Senator John Sherman Cooper; Solicitor General Archibald Cox; and Deon Latty.

Duke was the first law school to initiate the *Placement Bulletin*, an idea since adopted by a number of other schools. The *Placement Bulletin*, which is under the editorial supervision of the students themselves, lists the members of the senior class with their pictures and relevant biographical data. The placement bulletin is widely circulated among law offices, government offices and business offices and has proved to be an effective part of our placement program.

Most of the placement activity is in the third year, but we also cooperate fully with the students in canvassing potentials for the so-called "summer internship," for the summer following the second year of law study.

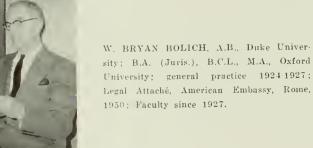
Duke Law School celebrates its annual Law Day on a weekend close to the National Law Day, U. S. A. The Duke Bar Association plays an important role in planning and carrying out the program of activities for the occasion. Speakers of national prominence and panel discussions of topics of importance to the profession typically are features of the celebration.

A ponel of toxation law experts from vorious sections of the country, all Duke Low graduates, discuss strotegy and toctics in tax cases for an audience composed of Duke Low students os well as practicing lowyers from far and wide. Left to right: Hugh G. Isley '53, J. Corlton Fleming '51, Leon L. Rice '36, and Numa L. Smith '41.





HANS W. BAADE, A.B., Syracuse University; Dr. iur. 1951, University of Kiel, Germany; LL.B., LL.M., 1955, Duke University; Diploma, 1956, Hagne Academy of International Law. Assistent, 1955, and Referent, 1956-59, Institute of International Law at the University of Kiel, Germany; Editoral Secretary, Jahrbuch für Internationa'es Recht; Faculty since 1960.





BRYSON

BRAINERD CURRIE, A.B., LL.B., Mercer University; LL.M., J.Sc.D., Columbia University; Instructor in Law, Mercer University, 1935-37; Assistant Professor of Law, Wake Forest College, 1937-41; Associate Professor of Law, University of Georgia, 1941-42; Professor of Law, Duke University. 1946-49; Professor of Law, University of California, Los Angeles, 1949-52; Dean and Professor of Law, University of Pittsburgh. 1952-53; Professor of Law, University of Chicago, 1953-61; Faculty since 1961.

EDWIN C. BRYSON, University of North

Carolina, 1922-1925; Duke University, 1932-1933; LL.B., University of Oregon; general

practice, 1927-1930; Duke University Counsel

since 1945; Faculty since 1947.

The Law Faculty at Duke University

An outstanding faculty of efficient size and a student body of high quality are the hallmarks of a fine law school. Besides maintaining a high ratio of law faculty to students, with emphasis placed on individualized instruction, the Duke Law School has been unusually fortunate in attracting a faculty of outstanding quality and reputation. The brief biographical faculty data here shown, which does not include their long list of published writings, or their scholastic honors (e.g., Phi Beta Kappa, summa cum laude, Rhodes Scholarships, etc.), indicate the unusually high qualifications of the present faculty.

The aggregate law practice experience of these members of the faculty has been varied and extensive.



ELVIN R. LATTY, B.S., Bowdoin College: J.D., University of Michigan; J.Sc.D., Columbia University: general practice, 1930. 1933: Associate Professor of Law, University of Kansas, 1934-1935; Professor of Law. University of Missouri, 1935-1937; Special Assistant to the American Ambassador, Caracas. 1942-1943; Acting Assistant Chief. Foreign Funds Control Division, Department of State, 1943; Fulbright Lecturer, University of Pavia (Italy) 1954; Faculty since 1937, and Dean.

ROBINSON O. EVERETT, A.B., LL.B., Harvard University; U.S.A.F., 1951-1953; Commissioner, U. S. Court of Military Appeals, 1953-1955; General practice, Durham, N. C. and Washington, D. C.; Faculty 1950-1951 and since 1956.



EVERETT

PAUL HARDIN III, A.B., LL.B., Duke University; general practice, 1954; Military Service, United States Army Intelligence, 1954-56; general practice 1956-58; legal studies and researches, University of Edinburgh, summer 1962 (Ford Foundation Grant); Faculty since 1958.



HARDIN

CLARK C. HAVIGHURST, A.B., Princeton University; J.D. Northwestern University; Military Service, 1958-60; Research Associate, Small Business Studies, Duke University, 1960.61; private practice, 1961.64; Faculty since 1964.







JOHN D. JOHNSTON, JR., A.B., LL.B., Duke University; with J. P. Morgan Co., New York City, 1956-58. General Practice in Asheville, N. C., 1958-62; Faculty since 1962, and Assistant Dean.

Faculty niversity

culty of efficient size high quality are the aw school. Besides io of law faculty to placed on individuduke Law School has tate in attracting a quality and reputaraphical faculty data es not include their lawritings, or their writings, or their phi Beta Kappa, thodes Scholarships, sually high qualificatulty.

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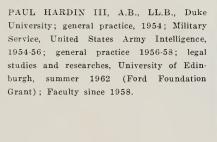
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EVERETT



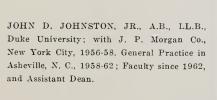
HARDIN



CLARK C. HAVIGHURST, A.B., Princeton University; J.D. Northwestern University; Military Service, 1958-60; Research Associate, Small Business Studies, Duke University, 1960-61; private practice, 1961-64; Faculty since 1964.



HAVIGHURST





JOHNSTON



chigan; J.Sc.D., Coleral practice, 1930or of Law, University Professor of Law, 1935-1937; Special in Ambassador, Caraag Assistant Chief, Division, Department tht Lecturer, Univer-

1954; Faculty since



LARSON

ARTHUR LARSON, A.B., LL.D., Augustana College; M.A. (Jurisp.), B.C.L., Oxford University; Fellow of Pembroke College, Oxford; Gen. Prac. 1935-39; Ass't Prof. of Law, Univ. of Tenn., 1939-41; Division Counsel, Office of Price Administration, 1941-44; Chief, Scandinavian Branch, Foreign Economic Administration, 1944-45; Assoc. Prof. and Prof. of Law, Cornell Univ., 1945-53; Fulbright Fellowship, London School of Economics, 1952; Dean, Univ. Pittsburgh Law School, 1953-54; Under Secretary of Labor, 1954-56; Director, U. S. Information Agency, 1956-57; Spec. Ass't to the President of the United States, 1957-58; Faculty and Director Rule of Law Research Center since 1958.



LIVENGOOD

CHARLES H. LIVENGOOD, JR., A.B., Duke University; LL.B., Harvard University; general practice 1934-1940; Regional Attorney for the Seventh Region, Wage and Hour Division, U. S. Department of Labor, 1940-1941; Chief of the Wage-Hour Section, Office of the Solicitor of Labor, 1941-1942; general practice, 1945-1948; visiting prof. of law, Univ. of Sydney, 1958; Faculty since 1948.



LOWNDES

CHARLES L. B. LOWNDES, A.B., Georgetown University; LL.B., S.J.D., Harvard University; general practice 1926-1927; Assistant Professor of Law, Georgetown University, 1927-1928; Professor of Law, Georgetown University, 1928-1930, 1931-1934; Faculty since 1934.



O'NEAL

F. HODGE O'NEAL, A.B., LL.B., Louisiana State University; J.S.D., 1949, Yale University; S.J.D., 1954, Harvard University; Associate Professor of Law, University of Mississippi, 1945-46; Professor of Law, University of Mississippi, 1946-47; Acting Dean and Professor of Law, Walter F. George School of Law, Mercer University, 1948-56; Professor of Law, Vanderbilt University, 1956-59; Visiting Professor of Law, New York University, 1957-58; Faculty since 1959.

JOEL FRANCIS PASCHAL, A.B., LL.B., M.A., Wake Forest College; Ph.D., Princeton University; Instructor in Law, Wake Forest College, 1939-1940; U.S.N.R., 1942-1946; Instructor, Princeton University, 1946-1947; Research Director, North Carolina Commission for the Improvement of the Administration of Justice, 1947-1949; general practice, 1949-1954; Visiting Professor of Law, Duke University, 1952-1953; Faculty since 1954.



PASCHAL

MELVIN G. SHIMM, A.B., Columbia University; LL.B., Yale 'niversity; 2nd Lt., FA (AUS), 1943-1946; general practice, 1950-1951; Counsel, Wage Stabilization Board, 1951-1952; Bigelow Fellow, University of Chicago Law School, 1952-1953; Faculty since 1953.



SHIMM

WILLIAM W. VAN ALSTYNE, A.B., University of Southern California; LL.B., Stanford University; Certificate, 1961, Hague Academy of International Law; California Department of Justice, 1958; United States Department of Justice, 1958-59; Assistant Dean and Professor of Law, Ohio State University, 1959-64; Visiting Associate Professor of Law at Duke University, 1964; Visiting Associate Professor of Law at UCLA, Summer 1964; Senior Fellow at Yale University, 1964-65; Faculty since 1965.



VAN ALSTYNE

LAWRENCE G. WALLACE, A.B., M.P.A. (Master of Public Administration), Syracuse University; U. S. Air Force, 1953-55; Staff, Maxwell Graduate School, Syracuse University, 1956; LL.B. 1959, Columbia University; Associate, Covington & Burling, Washington, D. C., 1959-60; Law Clerk to Mr. Justice Black, U. S. Supreme Court, 1960-61; Faculty since 1961.



WALLACE

The Duke Law School

The Duke Law School is a national school and, as national law schools go, a small school. Its ratio of faculty to students is among the highest of the leading law schools and so is its faculty compensation scale. This means that the annual amount which Duke spends per student in giving legal education is, again, among the highest in the nation.

To conduct a school of law with a high calibre faculty of national and international note costs money. Duke law students, however, do not carry all the burden of that expense; fortunately a generous endowment, although not autonomous to the law school, carries much of the burden. The student's tuition pays only a fraction of the cost of giving him a legal education.

A law school of Duke's size is particularly well adapted to teach by the "case system" which prevails in this country. This involves teaching by Socratic discussion between student and instructor of actual and hypothetical cases, rather than by lectures which purport to set forth legal precepts in dogmatic fashion. We have managed to keep classes small enough to permit general participation in the student-instructor discussion. However, you must be prepared to find some law classes larger than many classes in the fine small colleges.

There are schools where a student, if he wants to discuss a point with the professor, must make an appointment two weeks in advance. At Duke a student simply appears before his professor's door (usually open) and asks: "Are you busy, Sir?". He may expect a reply: "Yes, I'm busy, but come in and let's see what's troubling you."

Although fully aware that a good lawyer must be a "practical" man who can do things (and not just think about them), legal education at Duke does not over-stress the practical. Beware of claims of practicality. Too often, in education, emphasis on practicality is the earmark of intellectual poverty and cultural barrenness. Law school is no place to learn how to fold legal documents or to learn law office management. A superior law school education is basically a *liberal* education in law. The type of training given at Duke Law School not only gets the young law graduate off to a fast start in his professional career, but also stands him in good stead later on.

The Program of Instruction

It takes three years of study (six semesters) to get the LL.B. degree. Duke maintains no summer school for law. If a Duke law student is determined to shorten the period of three years, he will be permitted, upon consultation with the Dean, to take summer courses at other approved law schools. Thereby he may finish in January of his senior year, instead of the following June. In general, however, the continuous study of law unrelieved by summer vacation is not recommended.

Duke Law School, like others, has had to face this problem in recent years: twenty-five years ago it took three years to complete the law school study; today it still takes three years despite the fact that within the last quarter century the law has grown tremendously in complexity, particularly in fields like Constitutional Law, Labor Law, Administrative Law, Business Regulation, Corporation Finance, International Law; how, then, to fit the law students for law practice in the same period of time? Constant revision in courses, content and method at Duke Law School has not only gone far to solve that problem but has at the same time, while retaining the so-called "casemethod" as its basic technique of instruction, improved upon those older teaching methods which have at times led to criticism of law schools by the active Bar.

The Graduate Program

Since this brochure is intended primarily for those who are thinking about the basic legal training in preparation for the bar, description of the program looking to the advanced degrees of Master of Laws, Master of Comparative Law and Doctor of Juridical Science is omitted. Information can be obtained by writing to the Dean.

The Court Room in the Low Building is the scene of mony professional gatherings. Below, reproduced with the permission of **Business Week**, is shown lost year's Conference on Securities Regulation.





Aerial view of main Duke University Campus.

Facilities

In September, 1962 the Law School moved into its new building, which was formally dedicated on April 27, 1963. This new home for the School, just off the Gothic-style core of the Campus, is of more modern design, material and construction, although in keeping with its surroundings. It consists of a classroom wing and a Library and Administration wing, with faculty offices in both wings. The classroom wing also houses the Rule of Law Research Center, as well as Small Business Researches. The library is unusually spacious in its reading room in relation to the size of the student body and is similarly spacious for book stacks and interspersed reading tables. The combined seating capacity in the library's main reading room, carrels and interstack tables can accommodate the entire student body at one sitting. So can the classrooms, not to speak of the numerous seminar, conference and lounge rooms. In addition, the new Court Room can hold most of the present student body. Student lockers and vending machines are conveniently located.

Plans are also under consideration for new living accommodations for unmarried law students. These would fittingly supplement the recently built married student housing facilities, which are situated near the new law building.



A Low Lounge offers a place for studying or a quiet conversation. The Low Building has a number of lounges.

Yes but

Can I Afford the Duke Law School? And Can I Get in?

Don't be dismayed by tall tales that at X Law School they turn down nine for every one who gets in. The truth is, rarely does any law school turn down as many as three out of four applicants, and there are not many law schools that turn down as many as two out of three applicants.

At any law school, your chances of getting in are good if you are above or only a bit below the average or median of the last entering class in either college record or LSAT score. If you are below in both, you can expect difficulty. However, admission is often a complicated process, not just a question of adding up your college record and LSAT score. Geographical representation, college representation, a sense of obligation to the region, an urge to experiment with varying combinations (e.g., a magna cum laude applicant with a LSAT score in the 400's; a 700 LSAT scorer with a "disinterested" college record and a blind spot in French), choice of leader-achiever type as against the back-room researcher, the Admission Officers' guess about next month's ratio of acceptances to offers—all these enter into the picture.

Most students entering Duke Law School were on the Dean's List in college, and most had LSAT scores (morning) above 600. Those rare few who have come in with LSAT scores in the 400's more than made up for it with some outstanding achievement, e.g., Phi Beta Kappa.

College administrators and pre-law advisers have some merit in their complaint that some law schools have overemphasized the morning LSAT score. Our own recent experience indicates that the LSAT score may have some significance, especially in light of the college record. In a recent class, the top 10% in grades at the end of the year were

students whose respective LSAT scores were 704, 679, 619, 665, 721, 763, 577, 600, 695, 637, 733—an average of 672; the bottom 10% had an average score of 575. On the other hand, in another recent class the top ten in grades had an average LSAT score of 625 while the bottom ten's average was close with 595. In both classes, however, the top 10% had far better college records than the bottom 10%.

Increasingly, applicants are taking the test in November of their

Senior year in preference to tests later in the year.

We try to limit our entering class to 100. We suggest that applicants get their application in by February 15.

Scholarships and Loans

Financial aid is available, sometimes by scholarship without loan, sometimes by loan without scholarship, often by a combination of the two. If a student intends to apply for scholarship, we prefer to receive that application with the application for admission.

Except for a few scholarships based purely on merit, scholarships are for those who combine genuine and serious financial need with records and scores well above the class median. Contrary to the postulates of the classical economists, in the field of scholarships supply never equals demand. Realistic scholarship applicants recognize this imbalance and are prepared to yield to the needier applicant.

Sometimes the applicant offered a loan says he doesn't want to start off in life with a debt load. Actually, indebtedness for legal education should be viewed as a sound investment.

Depending on the funds available loans are either on the generous terms of the National Student Loans (no interest accrues until one year out, then at 3 per cent, repayment thereafter over a 10-year period) or on terms only a bit less generous (1 per cent until graduation, then at 3 per cent, then 6 per cent after 5 years) or on purely commercial terms arranged through a bank.

EXPENSES

The typical basic expenses for a Duke law student for an academic year are:

Tuition	\$1400
Rooms (two in room)	250
*Board	550
*Books and Supplies	125
*Laundry	60
	\$2385
Travel	?
*Moderate estimate	

Naturally, the total figure will vary for the individual student, particularly the travel item.

Job Opportunities While in School

It is not advisable for a law student to attempt any substantial amount of outside work. Nevertheless, a student who is highly efficient in the use of his time can, by saving minutes that others waste, devote some of them to supplementing his other financial resources. A number of positions in the Law Library are filled by law students. Outstanding students (second and third year) are often employed to assist faculty members. The University maintains an office to aid students in finding employment, and many of the available jobs go to law students, since as a group they have proven their reliability over the years.

If you are married and your wife can teach school or do secretarial or nursing work, the opportunities for employment in the region in which the School is located are very good. Other employment opportunities are of course available. Of recent years, between one third and one half of the Duke law students have been married. Many of them have been able to pursue their law studies by virtue of the fact that their wives, if unburdened by small children, can hold jobs.

Some General Information

Rule of Law Research Center

A few years ago the Duke Law School established its Rule of Law Research Center, with Professor Arthur Larson as its Director.

The purpose of this Center is to advance the objective of getting legal rules and procedures accepted and used in the settlement of



The Rule of Law Research Center staff in June, 1963; Mr. Halderman, Mr. Partan, Dr. Grzybawski, Dr. Larsan, Dr. McClure, Mr. Nawaz, Mr. Crane, Mr. Liacauras.

international disputes, including disputes of a kind that threaten world peace. It aims to do this by maintaining a nucleus and clearing house for ideas, activities, and research that will advance this aim.

The Center has produced significant researches and publications. The establishment of the Center has broadened the range of international studies and researches available to Duke law students having particular interest in this area.

Publications

Law and Contemporary Problems

For over a quarter-center the Duke Law School has published four times a year Law and Contemporary Problems, a unique legal periodical which was originated with the underlying philosophy that to understand intelligently the role that law plays in any transaction or institution, one must also know the non-legal factors involved. These factors may be business matters or sociological, political or administrative matters. Accordingly, each issue is devoted to a symposium consisting of a number of articles, each of which is written by an expert in that particular field, legal or non-legal. Here are illustrative titles of recent symposia: Securities Regulation, Government Contracts, Jurimetrics, Academic Freedom, and The Soviet Impact On International Law. Here again the Duke Law School has pioneered. Despite imitators, Law and Contemporary Problems remains a unique and outstanding institution among the world's legal publications. Many issues have been used as texts in college and graduate school courses.

The Duke Law Journal

It has been the constant aim of the Law School to develop the capacity in its students to do superior legal writing, which is an indispensable requisite for a good lawyer. Not only is this objective emphasized in the program of instruction itself, but the students are also provided with a vehicle for the publication of their efforts. Appearing quarterly, the *Duke Law Journal* contains student commentaries on currently significant legal problems. Election to Editorial Board membership is based solely on merit.

The Journal of Legal Education; the Corporate Practice Commentator

Both of these well-known legal periodicals have their editorial offices at Duke Law School, under the editorship of Professor John D. Johnston and Professor F. Hodge O'Neal, respectively.

The Duke Bar Association

Professional, social, and other extra-curricular activities of the law school are conducted by the students themselves through the medium of the Duke Bar Association. This organization, which includes all the students in the Law School, is similar in composition and purpose both to a university student government and to a professional bar association of the kind to which you will belong as a practicing lawyer. It is also the center of the Law School's non-academic life.

The Association through its various committees carries on a wide variety of functions, including publishing the seniors' *Placement Bulletin*, assisting in moot court competitions, publicizing the activities of the Law School and of the individual students, procuring speakers of interest from the outside and providing well rounded athletic and social programs. The Association also administers the Law School Honor Code through an elected Judicial Board.

The Duke International Law Society

The internationally-minded law student can find at Duke Law School considerable to challenge him: formal courses in legal aspects of international affairs, the Rule of Law Research Center, the World Law section of the Duke Law Journal and the Duke International Law Society. The latter, a charter member (with the law schools of Columbia, Harvard, Virginia and Yale) of the Association of Student International Law Societies, has a program of researches, of participation in international moot court competitions and in conferences relating to international law, of engaging speakers in that field, and related activities. A substantial percentage of the Duke law students belong to the Society.



The Waman's Callege (1200 undergraduates) with its own nearby campus and distinctive architecture is autanomous, yet an integral part of Duke University.





At left the main lounge and at right the coffee shop of the Men's Graduate Living Center.

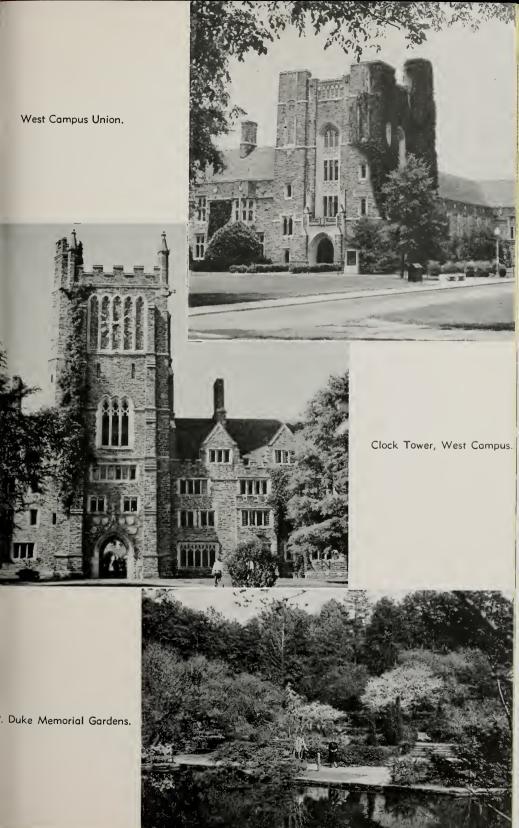
Law Living Quarters

Although some law students desire to live off campus, many of the non-married students live in the Men's Graduate Living Center. Here they reside with students from the School of Medicine, the Graduate School of Arts and Sciences, the Divinity School, and the School of Forestry. This Center, in addition to providing comfortable living quarters for 400 graduate and professional students, has its own dining rooms, lounges, recreational halls and study rooms.

Housing for married students is available in University-owned facilities. Rentals are \$70-90 a month including heat, light, water. These units are in great demand. (First come, first served.) In addition, adequate facilities for married students are available off campus at similarly reasonable prices.

Dean Latty explains a point of Business Associations low to the first year class.





NOTES

(Supplement To The Bulletin Of Duke University)

Law study and law training are stepping stones to many careers. A glance at any Duke Law School graduating class will illustrate the point. In recent years, for example, graduates have gone into government service (federal and state), judicial clerkships, business enterprises, graduate work, and teaching at the college and university level. The majority of Duke Law graduates, however, choose private practice with established firms.

Many law firms throughout the country have a so-called "summer internship" program for second-year students. This program enables the student to get an actual view of law practice as seen by the young associate in a modern, busy law office. Law firms look upon the program as a means of spotting talented young men for permanent association with the firm.

The following is a representative list (not complete) of the firms with which Duke Law graduates and "summer interns" of the past few years have

become associated:

Akerman, Senterfitt, Eidson, Mesmer & Robinson

Orlando, Florida

Alley, Maass, Rogers & Lindsay Palm Beach, Florida

Alston, Miller & Gaines Atlanta, Georgia

Anderson, Rush, Dean & Lowndes Orlando, Florida

Anderson, Walker & Reichert Macon, Georgia

Armbrecht, Jackson, McConnell & DeMouy Mobile, Alabama

Arnold & Porter Washington, D. C.

Arter, Hadden, Wykoff & Van Duzer Cleveland, Ohio

Baker & Daniels Indianapolis, Indiana

Baker, Hostetler & Patterson Cleveland, Ohio

Ballard, Spahr, Andrews & Ingersoll Philadelphia, Pennsylvania

Barnwell, Whaley, Stevenson & Patterson Charleston, South Carolina

Battle, Neal, Harris, Minor & Williams Richmond, Virginia

Beverly & Moyle West Palm Beach, Florida

Biehn & Thatcher Quakertown, Pennsylvania

Black, Cobb, Cole & Crotty Daytona Beach, Florida

Blackwell, Blackwell, Canady, Eller & Jones Winston-Salem, North Carolina

Boardman, Stoddard & Breul Bridgeport, Connecticut Boyd, Walker & Concannon Keokuk, Iowa

Bradley, Arant, Rose & White Birmingham, Alabama

Breeden, Howard & MacMillan Norfolk, Virginia

Broad & Cassel Miami Beach, Florida

Brown, Connery, Culp & Wille Camden, New Jersey

Brown, Connolly, Paddock & Roszkowski Rockford, Illinois

Brown, Wood, Fuller, Caldwell & Ivey New York, New York

Brumbaugh, Free, Graves & Donahue New York, New York

Bryant, Lipton, Bryant & Battle Durham, North Carolina

Buffinton, Crowther, Bogle & Westgate Fall River, Massachusetts

Bunker, Elliott & Mooney Plainfield, New Jersey

Burlingham, Underwood, Barron, Wright & White

New York, New York

Buschmann, Carr, Schabel & Tabbert Indianapolis, Indiana

Cabot, Scott & Wenkstern Ft. Lauderdale, Florida

Cadwalader, Wickersham & Taft New York, New York

Calfee, Fogg, McChord & Halter Cleveland, Ohio

Candler, Cox, McClain & Andrews Atlanta, Georgia

Carpenter, Bennett & Morrissey Newark, New Jersey Carr & Gibbons Wilson, North Carolina

Christensen, Driscoll & Caliendo New York, New York

Claussen, Hirsch, Miller & Gorman Chicago, Illinois

Cline, Williams, Wright, Johnson, Oldfather & Thompson

Lincoln, Nebraska

Coffin, Grifo & De Raymond Easton, Pennsylvania

Coke & Coke Dallas, Texas

Coker, Carlon & Sobo Ft. Lauderdale, Florida

Coleman, Gantt & Ramsay Pine Bluff, Arkansas

Cowart & Ritchie Cocoa, Florida

Cravath, Swaine & Moore New York, New York

Crockett, Tutwiler & Crockett Welch, West Virginia

Cross, Shriver, Bright & Washburne Baltimore, Maryland

Cummings & Lockwood Stamford, Connecticut

Cushman, Darby & Cushman Washington, D. C.

Davenport, Johnston, Harris & Urquhart Panama City, Florida

Davis, Graham & Stubbs Denver, Colorado

Davis, Polk, Wardell, Sunderland & Kiendle New York, New York

Dechert, Price & Rhoads Philadelphia, Pennsylvania

Denny, Valentine & Davenport Richmond, Virginia

Deramus & Johnston Birmingham, Alabama

Dickinson, Wright, McKean & Cudlys Detroit, Michigan

Doherty, Rumble & Butler St. Paul, Minnesota

Donovan, Leisure, Newton & Irvine New York, New York

Dresbach, Crabbe, Newlon, Bilger, Brown & Jones Columbus, Ohio

Ounbar Kiongle &

Dunbar, Kienzle & Murphy Columbus, Ohio

Durey & Pierson Stamford, Connecticut

DeLange, Hudspeth, Pitman & Katz Houston, Texas

Eaton, Bell, Hunt & Seltzer Charlotte, North Carolina

Effron & Goldberg Poughkeepsie, New York

Eisman, Lee, Corn, Sheftel & Bloch New York, New York Ely, Guess, Rudd & Havelock Anchorage, Alaska

English, McCaughan & O'Bryan Fort Lauderdale, Florida

Erickson, Popham, Haik & Schnobrich Minneapolis, Minnesota

Everett, Everett & Everett Durham, North Carolina

Farrington & Curtis Springfield, Missouri

Fisher & Phillips Atlanta, Georgia

Fleming, Robinson & Bradshaw Charlotte, North Carolina

Foley, Sammond & Lardner Milwaukee, Wisconsin

Fowler, White, Gillen, Humkey & Trenam Tampa, Florida

Gibson, Dunn & Crutcher Los Angeles, California

Gifford, Woods, Carter & Hays New York, New York

Giles, Hedrick & Robinson Orlando, Florida

Gottfried, Ginsberg, Guren & Merritt Cleveland, Ohio

Grant, Shafroth, Toll & McHendrie Denver, Colorado

Grier, Parker, Poe & Thompson Charlotte, North Carolina

Grossman, Schlesinger & Carter Cleveland, Ohio

Haas, Dunaway, Shelfer & Haas Atlanta, Georgia

Hahn, Loeser, Freedheim, Dean & Wellman Cleveland, Ohio

Hamel, Morgan, Park & Saunders Washington, D. C.

Hand, Arendall, Bedsole, Greaves & Johnston Mobile, Alabama

Hansell, Post, Brandon & Dorsey Atlanta, Georgia

Haynsworth, Perry, Bryant, Marion & Johnston Greenville, South Carolina

Helsell, Paul, Fetterman, Todd & Hokanson Seattle, Washington

Hershey & Bliss Taylorville, Illinois

Hicks, Kuhlthau & Nagle New Brunswick, New Jersey

Hinckley, Allen, Salisbury & Parsons Providence, Rhode Island

Holcombe & Bomar Spartanburg, South Carolina

Holland & Hart Denver, Colorado

Holland, Parker & Ricketts Blowing Green, Kentucky

Holme, Roberts, & Owen Denver, Colorado

Holmes, Ross, Woodson, Millard & Ryburn Pasadena, California Hoskins, King, Springer & McGannon Kansas City, Missouri

Howard & Lewis Provo, Utah

Hudson, Ferrell, Petree, Stockton, Stockton & Robinson

Winston-Salem, North Carolina

Hunton, Williams, Gay, Powell & Gibson Richmond, Virginia

Irwin, Irwin & Irwin Carlisle, Pennsylvania

Jackson, Walker, Winstead, Cantwell & Miller Dallas, Texas

Jennings, Strouss, Salmon & Trask Phoenix, Arizona

Johnson, Weston, Hurd, Fallen, Sullivan & Paisley Cleveland, Ohio

Jones, Benson & Dwyer Erie, Pennsylvania

Jones, Bird & Howell Atlanta, Georgia

Jones, Day, Cockley & Reavis Cleveland, Ohio

Kelley, Drye, Newhall, Maginnes & Warren New York, New York

Kennedy, Covington, Lobdell & Hickman Charlotte, North Carolina

Kirkpatrick, Pomeroy, Lockhart & Johnson Pittsburgh, Pennsylvania

Lange, Simpson, Robinson & Somerville Birmingham, Alabama

LaRogue, Allen & Cheek Kinston, North Carolina

Latham & Watkins Los Angeles, California

Lee & Lee Lumberton, North Carolina

Lewis, Roca, Scoville, Beauchamp & Linton Phoenix, Arizona

Lord, Day & Lord New York, New York

McCarter & English Newark, New Jersey

McCune, Hiaasen, Crnm & Ferris Ft. Lauderdale, Florida

McDougle, Ervin, Horack & Snepp Charlotte, North Carolina

McLane, Carleton, Graf, Green & Brown Manchester, New Hampshire

McNees, Wallace & Nnrick Harrisburg, Pennsylvania

Maguire, Vorhis & Wells Orlando, Florida

Mahoney, Hadlow, Chambers & Adams Jacksonville, Florida

Maskenjia, Smith, Lewis, Michell & Hughes Syracuse, New York

Mayer, Friedlich, Spiess, Tierney, Brown & Platt

Chicago, Illinois

Miller & Chevalier Washington, D. C. Miller, Martin, Hitching, Tipton & Lenihan Chattanooga, Tennessee

Mirick, O'Connell, DeMallie & Lougee Worcester, Massachusetts

Mitchell, Pershing, Shetterly & Mitchell New York, New York

Moore & Van Allen Charlotte, North Carolina

Morris, James, Hitchens & Williams Wilmington, Delaware

Morrison, Hecker, Cozad & Morrison Kansas City, Missouri

Mullen, Holland & Harrell Gastonia, North Carolina

Musick, Peeler & Garrett Los Angeles, California

Newsom, Graham, Strayhorn & Hedrick Durham, North Carolina

Nichols, Gaither, Beckham, Colson & Spence Miami, Florida

Nixon, Hargrave, Devans & Doyle Rochester, New York

Nixon, Mudge, Rose, Guthrie & Alexander New York, New York

Olwine, Connelly, Chase, O'Donnel & Weyher New York, New York

O'Mara, Schumann, Davis & Lynch Jersey City, New Jersey

O'Melveny & Myers Los Angeles, California

Overton, Lyman & Prince Los Angeles, California

Parkinson, Sessions, Duffet & Barry Daytona Beach, Florida

Patterson, Belknap & Webb New York, New York

Patterson, Fruman, Richardson & Watson Jacksonville, Florida

Peters & Prather Meadville, Pennsylvania

Phillips, Lytle, Yorkey, Letchworth, Hitchcock & Blaine Buffalo, New York

Piper & Marbury Baltimore, Maryland

Pogue, Helmholz, Culbertson & French Cincinnati, Ohio

Porter, Stanley, Treffinger & Platt Columbus, Ohio

Powe, Porter & Alphin Durham, North Carolina

Powell, Goldstein, Frazer & Murphy Atlanta, Georgia

Poyner, Geraghty, Hartsfield & Townsend Raleigh, North Carolina

Raymond, Mayer, Jenner & Block Chicago, Illinois

Reavis & McGrath New York, New York

Reed, Egler, McGregor & Reinstadtler Pittsburgh, Pennsylvania

Reed, Smith, Shaw & McClay Pittsburgh, Pennsylvania Rich, Smallridge & Terrie Charleston, West Virginia

Richards & Sheffe Charlotte, North Carolina

Rives, Peterson, Pettus & Conway Birmingham, Alabama

Rizzo, Aloi, Grasso & Urcluoli Syracuse, New York

Rogers, Hoge & Hills New York, New York

Rogers, Towers, Bailey, Jones & Gay Jacksonville, Florida

Rose, Meek, House, Barron, Nash & Williamson

Little Rock, Arkansas

Ross, McCord, Ice & Miller Indianapolis, Indiana

Royall, Koegel & Rogers New York, New York

Rush, Reed & Marshall Orlando, Florida

Saul, Ewing, Remick & Saul Philadelphia, Pennsylvania

Sayles, Evans, Brayton, Palmer & Tifft Elmira, New York

Schiff, Hardin, Waite, Dorschel & Britton Chicago, Illinois

Schlesinger, Galvin, Kohn & Landefeld Cleveland, Ohio

Sellers, Conner & Cuneo Washington, D. C.

Scemes, Bowen & Seemes Baltimore, Maryland

Seyfarth, Shaw, Fairweather & Geraldson Chicago, Illinois

Shackleford, Farrior, Stallings, Glos & Evans Tampa, Florida

Shadyac, Berg & Nolan Arlington, Virginia

Shanley & Fisher Newark, New Jersey

Sharp & Bogan Washington, D. C.

Shearman & Sterling New York, New York

Sheppard, Mullin, Richter & Hampton Los Angeles, California

Shumaker, Loop & Kendrick Toledo, Ohio

Shutts, Bowen, Simmons, Prevatt, Boureau & White
Miami, Florida

Sidley, Austin, Burgess & Smith Chicago, Illinois

Simpson, Thacher & Bartlett New York, New York

Skeel, McKelvy, Henke, Evenson & Uhlmann Seattle, Washington

Smith, Swift, Currie, McGhee & Hancock Atlanta, Georgia

Spears, Moore, Rebman & Williams Chattanooga, Tennessee

Spears & Spears Durham, North Carolina Squire, Sanders & Dempsey Cleveland, Ohio

Stoll, Keenan & Park Lexington, Kentucky

Strang, Fletcher, Carriger & Walker Chattanooga, Tennessee

Sullivan & Cromwell New York, New York

Sutherland, Asbill & Brennan Atlanta, Georgia

Swann & Swann Orlando, Florida

Swift, Pease, Davidson & Chapman Columbus, Georgia

Taft, Stettinius & Hollister Cincinnati, Ohio

Tenney, Bentley, Guthrie & Howell Chicago, Illinois

Thigpen & Hines Charlotte, North Carolina

Thompson, Hine & Flory Cleveland, Ohio

Townsend, Elliott & Munson Philadelphia, Pennsylvania

Walter, Haverfield, Buescher & Chuckley Cleveland, Ohio

Warner, Norcross & Judd Grand Rapids, Michigan

Watts, Salmon, Roberts & Stevens Huntsville, Alabama

Weaver & Glassie Washington, D. C.

Webster, Sheffield, Fleischmann, Hitchcock & Chrystie New York, New York

White & Case

New York, New York Whiting, Moore, Hunoval & Herman Newark, New Jersey

Willcox, Cooke, Savage & Lawrence Norfolk, Virginia

Willkie, Farr, Gallagher, Walton & Fitzgibbon New York, New York

Wilson, Branch, Barwick & Vandiver Atlanta, Georgia

Wilson, Woods & Villalon Washington, D. C.

Winston, Strawn, Smith & Patterson Chicago, Illinois

Wise, Roetzel, Maxon, Kelly & Andress Akron, Ohio

Wiser, Shaw, Freeman, Ickes & Williams Rochester, New York

Womble, Carlyle, Sandridge & Rice Winston-Salem, North Carolina

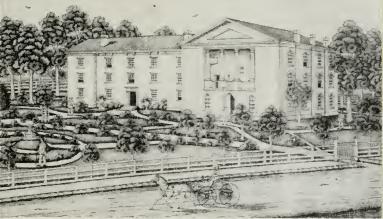
Wright, Lindsey & Jennings Little Rock, Arkansas

Wright & Shuford Asheville, North Carolina

Yarborough, Blanchard, Tucker & Yarborough Raleigh, North Carolina

Younge, Frederick & Rutherford Poeria, Illinois





Mordecai (1904-1927)

Trinity College in Randolph County about 1860

History of the Law School

Duke University is built around Trinity College, which goes back in its origin to the year 1838-1839, when Union Institute was founded. The teaching of law as part of a cultural education constituted the beginning of legal instruction in this institution in 1850. Professional education for law began in 1868 when the Department of Law of Trinity College was established.

The modern School of Law was founded in 1904 upon an endowment established by James B. and Benjamin N. Duke. Dr. Samuel Fox Mordecai, distinguished lawyer, scholar and teacher, organized the School and was its Dean until his death in 1927. The establishment of this School set a new standard in southern legal education, it being the first law school in the area to require the completion of two years of college work as an entrance requirement. The case method was used as the basis of instruction; and in this respect also the School was a pioneer in law-school method in this area. The completion of three years resident study was required for the LL.B. degree.

As a result of the foundation of Duke University in 1924, the School of Law has shared in the expansion incident thereto. In 1930, with the removal of the Law School to the newly completed Law Building, and the appointment of a greatly increased faculty and staff, the Law School entered upon a new stage. It was reorganized and the curriculum and professional activities much broadened, with the purpose of creating in this southeastern area a progressive law school of national scope and character.

Throughout its history the School has emphasized quality rather than quantity of student body.

Since the reorganization of the School in 1930, the following persons have served as Deans or Acting Deans: Justin Miller, 1930-1934; H. Claude Horack, 1934-1947; Harold Shepherd, 1947-1949; Charles L. B. Lowndes, 1949-1950; Joseph A. McClain, Jr., 1950-1956; Dale F. Stansbury, 1956-1957; Elvin R. Latty, since 1957.

Further Information may be obtained from:

The Dean School of Law Duke University Durham, N. C.

BULLETIN OF DUKE UNIVERSITY

Summer Session 1967



Annual Bulletins

For Bulletin of Information for Prospective Students, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The School of Engineering, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to The Dean of the Divinity School, Duke University, Durham, N. C.

For Bulletin of The School of Forestry, apply to The Dean of the School of Forestry, Duke University, Durham, N. C.

For Bulletin of The Graduate School of Arts and Sciences, apply to The Dean of the Graduate School, Duke University, Durham, N. C.

For Bulletin of The School of Law, apply to The Dean of the School of Law, Duke University, Durham, N. C.

For Bulletin of The School of Medicine, apply to The Dean of the School of Medicine, Duke University, Durham, N. C.

For Bulletin of The School of Nursing, apply to The Dean of the School of Nursing, Duke University, Durham, N. C.

For Bulletin of The Summer Session, apply to The Director of the Summer Session, Duke University, Durham, N. C.

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ADDITION - 1967 SUITHER SESSION - TERM I - June 12-July 18

Economics 57. Principles of Accounting. Elementary principles of single proprietorship, partnership, and corporation accounting. 7:40-9:00. 3 s.h. Lindloff



BULLETIN OF DUKE UNIVERSITY

Summer Session 1967



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Calendar of the Summer Session, 1967

First Term: June 12-July 18 Second Term: July 20-August 25

June

Sunday, 12:00 noon—Dormitories ready for occupancy 11

Sunday-Saturday-Basketball Clinic 11-24

Monday—Registration for First Term 12

12-July 18-NDEA English Institute

Tuesday-Instruction begins in all courses of the First Term except 4 s.h. science courses

Monday-Instruction begins in 4 s.h. courses of First Term in Chemistry, Geology, and Physics

20, 21, 22 Tuesday, Wednesday, Thursday-Piano Clinic Tuesday, Wednesday-School Law Conference

21-August 24, Wednesday-Thursday-ABC Program

22-August 24-National Science Foundation Institute Program

Friday-Final date for filing with the Graduate Office Statement of Intention to complete, during the First Term, requirements for the Master's degree. If a thesis is to be presented, the title is to be filed at the same time as the Statement of Intention.

26-July 22, Monday-Saturday—Medical Mycology Course

July

Saturday-Tuesday-Modern Mathematics Workshop for Ele-1-18 mentary Teachers

Monday, Tuesday-No classes 3-4

Monday-Registration closes for ETS examinations 3

Wednesday-French and Spanish examinations for candidates for graduate degrees, 4:00 p.m., 229 Allen Building. Candidates register in the Graduate School Office not later than June

Monday-Major examination for candidates for the M.Ed. 10

degree without thesis

July (Continued)

Wednesday—English examination for foreign students; room and hours to be announced. Register in the Graduate School office through July 5

17-18 Monday, Tuesday-Final examinations for First Term

17-28 Monday-Friday-Clinic in Preaching

17-28 Monday-Friday-Clinic in Church Planning and Development

17-28 Monday-Friday-Clinic in Pastoral Care

17-28 Monday-Friday-Clinic in Systematic Theology

- 20 Thursday-Registration for all Second Term courses, including science courses
- 21 Friday—Instruction begins in all Second Term courses including science courses
- 24 Monday—Final date for filing with the Graduate Office Statement of Intention to complete, during the Second Term, requirements for the Master's degree. If a thesis is to be presented, the title is to be filed at the same time as the Statement of Intention

August

5 Saturday—ETS Language examinations in French, German, and Russian, 125 Engineering Building, 9:00 a.m.; registration at University Counseling Center through July 3, fee \$8

6-19 Sunday-Saturday—Basketball Clinic

12 Saturday—No Classes

- 14 Monday-Last day for submitting theses for Master's degree
- 14 Monday—Major examination for candidates for the M.Ed. degree without thesis
- 17 Thursday—Final examination in all 4 s.h. courses of the Second Term in Chemistry, Geology, and Physics

24-25 Thursday, Friday-Final examinations in all courses of the Second Term, except science courses ending on August 17

Friday-Final date for completion of requirements for degrees to be awarded September 1 by the Graduate School of Arts and Sciences

Administrative Officers for the Summer Session

Douglas Maitland Knight, Ph.D., Litt.D., LL.D., L.H.D., President

Robert Taylor Cole, Ph.D., Provost

Frank Leon Ashmore, A.B., Vice President for Institutional Advancement Gerhard Chester Henricksen, M.A., C.P.A., Vice President and Treasurer Everett Harold Hopkins, M.A., LL.D., Vice President for Planning and Institutional Studies, Assistant Provost

Charles B. Huestis, Vice President for Business and Finance

Frank Traver de Vyver, Ph.D., Vice Provost

Harold Walter Lewis, Ph.D., Dean of Arts and Sciences and Vice Provost Richard Lionel Predmore, D.M.L., Vice Provost and Dean of the Graduate School of Arts and Sciences

Barnes Woodhall, M.D., Vice Provost

Craufurd David Goodwin, Ph.D., Assistant Provost

Robert H. Ballantyne, Ed.D., Assistant to the President for Planning

Benjamin Edward Powell, Ph.D., Librarian

Richard Lovejoy Tuthill, Ed.D., University Registrar

Rufus H. Powell, LL.B., Secretary of the University

Edwin Constant Bryson, LL.B., University Counsel

Stephen Cannada Harward, A.B., C.P.A., Comptroller and Internal Auditor

William George Anlyan, M.D., Dean of the School of Medicine

Olan Lee Petty, Ph.D., Director of the Summer Session

Mary Margaret Ball, Ph.D., Dean of the Woman's College

Virginia Bryan, Ph.D., Assistant Dean of Undergraduate Instruction, The Woman's College

Annie Leigh Broughton, M.A., Acting Assistant Dean of Undergraduate Instruction, The Woman's College

Cazlyn Green Bookhout, Ph.D., Director of the Duke Marine Laboratory William Lambreth Brinkley, Jr., M.P.S., Director of Undergraduate Admissions

Francis Ezra Bowman, Ph.D., Associate Dean, Acting Dean, and Director of Admissions, The Graduate School of Arts and Sciences

Robert Earl Cushman, Ph.D., Dean of the Divinity School

Ellwood Scott Harrar, Ph.D., Dean of the School of Forestry

Ann Madeline Jacobansky, R.N., M.Ed., Dean of the School of Nursing James Lathrop Meriam, Ph.D., Dean of the School of Engineering

Edward K. Kraybill, Ph.D., Associate Dean for Undergraduate Study of the School of Engineering

James Ligon Price, Jr., Ph.D., Dean of Trinity College and Associate Dean of Arts and Sciences

Charles Buchanan Johnson, Ed.D., Associate Dean of Trinity College Hugh M. Hall, Ph.D., Associate Dean of Trinity College and Dean of Freshmen

Dana Phelps Ripley, Ph.D., Assistant Dean of Trinity College

Ellen Harris Huckabee, A.M., Dean of Undergraduate Instruction and Acting Dean of the Woman's College

Jane Philpott, Ph.D., Associate Dean of Undergraduate Instruction, The Woman's College

Mary Grace Wilson, A.M., Dean of Undergraduate Women

Ellen C. Guiney, M.A., Residence Director and House Counselor for Graduate Women, First and Second Terms

Mildred D. Durden, M.Ed., House Counselor for Undergraduate Women, First Term

Mary Helen Stasavich, A.B., House Counselor for Undergraduate Women, Second Term

James T. Cleland, D.D., Dean of the Chapel

Howard Charles Wilkinson, D.D., Chaplain to the University and Director of Religious Activity

Paul Young, M.A., Director of Choral Music

Walter Scott Persons, A.B., Recreation Supervisor for the Summer Session

The Summer Session Faculty

Barnes, Robert, Ph.D., Visiting Professor of Zoology Baxley, John V., Ph.D., Assistant Professor Mathematics Bean, Frank, M.A., Instructor in Sociology Berón, Sonia, M.A., Instructor in Romance Languages Best, Thomas W., Ph.D., Assistant Professor of German Bolmeier, Edward Claude, Ph.D., Professor of Education Bonk, James, Ph.D., Assistant Professor of Chemistry Brown, Frances Campbell, Ph.D., Professor of Chemistry Bryan, Anne-Marie, M.A.T., Instructor in Romance Languages Budd, Louis, J., Ph.D., Associate Professor of English Byrd, J. Scott, M.A., Instructor in English Carpenter, David W., Ph.D., Professor of Physics Carson, Robert C., Ph.D., Associate Professor of Psychology Cartwright, William H., Ph.D., Professor of Education Colton, Joel G., Ph.D., Professor of History Condos, Apostolos, Ph.D., Assistant Professor of Economics Cox, R. Merritt, M.A., Instructor in Romance Languages Darroch, Gordon, M.A., Lecturer in Sociology Davies, David George, Ph.D., Professor of Economics Davis, Otho, M.A., Assistant Professor of Physical Education Durden, Robert T., Ph.D., Professor of History Efird, James Michael, Ph.D., Assistant Professor of Biblical Studies Engelhardt, Max, Ph.D., Lecturer in Education Erickson, Carl, Ph.D., Assistant Professor of Psychology Feather, Ben, Ph.D., Lecturer in Psychology Ferguson, Oliver, Ph.D., Associate Professor of English Finger, J. Michael, B.A., Assistant Professor of Economics Gehman, Ila, Ed.D., Associate Professor of Medical Psychology Gehman, S., Jr., Ph.D., Associate Professor of Psychology in Education Githens, Sherwood, Jr., Ph.D., Professor of Education Glenn, Richard, B.A., Instructor in Romance Languages Goodling, Richard, Ph.D., Associate Professor of Pastoral Care

Gray, Irving Emery, Ph.D., Professor of Zoology Grislis, Egil, Ph.D., Associate Professor of Historical Theology Hankin, Robert M., Ph.D., Assistant Professor of Russian Heron, Stephen Duncan, Jr., Ph.D., Associate Professor of Geology Himes, Joseph, Ph.D., Visiting Professor of Sociology Hinrichs, Lowell A., Ph.D., Assistant Professor of Mathematics Hipps, Gary M., Ed.D., Visiting Assistant Professor of Education Hodel, Richard Earl, Ph.D., Assistant Professor of Mathematics Hurlburt, Allan S., Ph.D., Professor of Education Huse, Mary Martin, Ph.D., Associate Professor of Medical Psychology Jackson, Wallace, Ph.D., Assistant Professor of English Jennings, Edward M., III, Ph.D., Assistant Professor of English Jezierski, Bronislas de Leval, Ph.D., Associate Professor of Russian Language and Literature Kilgore, John W., Ph.D., Visiting Assistant Professor of Chemistry

Kitchen, Joseph W., Ph.D., Assistant Professor of Mathematics Krantz, Frederick H., A.B., Instructor in History Langford, Thomas A., Ph.D., Associate Professor of Religion Leach, Richard H., Ph.D., Professor of Political Science Lerner, Warren, Ph.D., Associate Professor of History Lynts, George W., Ph.D., Professor of Geology McCollough, Thomas S., Th.D., Associate Professor of Religion Miller, Gustavus H., Ph.D., Assistant Professor of Romance Languages Moore, Lawrence C., Ph.D., Assistant Professor of Mathematics Nelson, Roland H., Ed.D., Professor of Education Noggle, Burl, Ph.D., Visiting Associate Professor of History O'Keefe, Charles, A.B., Instructor in Romance Languages Palmer, Richard A., Ph.D., Assistant Professor of Chemistry Partin, Harry B., Ph.D., Assistant Professor of Religion Peach, William Bernard, Ph.D., Professor of Philosophy Pilkey, Orrin, Ph.D., Assistant Professor of Geology Reed, Wallace, Ph.D., Assistant Professor of Economics Reiss, Edmund A., Ph.D., Professor of English Reynolds, Thomas D., Ph.D., Associate Professor of Mathematics Roberts, John Henderson, Ph.D., Professor of Mathematics Ropp, Theodore, Ph.D., Professor of History Salinger, Herman, Ph.D., Professor of German Sandefur, Earl Wilton, Ed.D., Visiting Lecturer Searles, R. B., Ph.D., Assistant Professor of Botany Seymour, Richard K., Ph.D., Associate Professor of German Simono, Ronald Bernard, Ph.D., Assistant Professor of Education Smith, D. Moody, Ph.D., Associate Professor of New Testament Inter-

pretation Smith, Grover C., Ph.D., Associate Professor of English Smith, D. S., II, M.H.A., Assistant Professor of Hospital Administration Stanley, D. Keith, Jr., Ph.D., Assistant Professor of Greek
Stefansson, Unnsteinn, Ph.D., Adjunct Professor of Duke University
Stevenson, Lionel, Ph.D., James B. Duke Professor of English
Strandberg, Victor, Ph.D., Assistant Professor of English
Stumpf, W. A., Ph.D., Professor of Education
Sublett, Henry L., Jr., Ed.D., Associate Professor of Education
Sullivan, Herbert P., Ph.D., Associate Professor of Religion
Tate, Robert S., Jr., M.A., Instructor in Romance Languages
Tice, John, Ph.D., Assistant Professor of Philosophy
Toren, E. Clifford, Jr., Ph.D., Assistant Professor of Chemistry
Torre, Elias, Doctor en Filosofia y Letras (Madrid), Associate Professor
of Romance Languages

Twyman, Robert, Ph.D., Visiting Professor of History
Vernberg, F. John, Ph.D., Associate Professor of Zoology
Vernon, John M., Ph.D., Assistant Professor of Economics
Wilbur, Robert L., Ph.D., Associate Professor of Botany
Willhoite, Fred H., Jr., Ph.D., Visiting Associate Professor of Political
Science

Williamson, Donald, B.A., Assistant Professor of Pastoral Care Wilson, Robert N., Ph.D., Visiting Professor of Mental Health Womble, C. Hilburn, Ph.D., Assistant Professor of Classical Studies Wooley, Allan D., Ph.D., Assistant Professor of Classical Studies Yohe, William P., Ph.D., Professor of Economics



General Information

The Summer Session at Duke University makes available to Duke students, to students from other universities and colleges, to teachers in elementary and secondary schools, and to other special students a notable program of instruction in many fields of knowledge, both academic and professional.

Course programs offered during the summer are designed to meet special and particular needs as well as the more conventional require-

ments leading to specific degrees.

Postdoctoral research scholars may find the regular Summer Session courses useful for further study. The library facilities and the various

laboratories may be of value for postdoctoral residents.

Graduate students who have been admitted to the Graduate School to study for the Master of Arts, Master of Education, and Master of Arts in Teaching degrees will find courses arranged in sequence from summer to summer to meet their requirements.

Teachers from elementary and secondary schools who desire to earn credits toward the renewal of their certificates and who are interested in further teacher training in subject content and method may enroll in senior-graduate courses as special or unclassified students.

Undergraduates of Duke University who desire to accelerate their programs may complete the work for a degree in three years by attending

two or more Summer Sessions.

Undergraduates from other colleges and universities may enjoy the

special advantages of summer instruction at Duke and transfer earned credits to their own institutions.

Graduates of accredited high schools, both men and women, who have been admitted to the freshmen class of Duke University may begin their work in the Summer Session.

While the summer course program meets in many departments the needs of degree candidates, it goes beyond these limits in presenting also courses of wide general interest and, in addition, special non-credit lectures, conferences, institutes, and workshops.

Duke University's ample and modern research facilities will be available during the summer to all properly qualified students. It is the hope of the University, of the summer faculty, and of the administrative officers that former students and new students will find increasing values in each summer spent at Duke.



Courses of Study and Requirements for Degrees

Undergraduate Study

Students in the undergraduate colleges of Duke University who desire to enrich or accelerate their academic programs will find the summer offerings of interest. Special courses are provided which are not otherwise available to undergraduates: election of the usual course offerings may relieve an overload during the fall or spring terms. Summer programs enable some students to attain provisional graduate status in the senior year or to graduate early.

By attending both terms of the Summer Session it is possible for a student to elect as many as four courses and earn up to 12 s.h. credit. Instruction will be offered in the summer of 1967 in most departments and colleges. Specific requirements for degrees offered in the undergraduate colleges may be obtained from the regular *Bulletin* of Undergraduate

Instruction.

School of Nursing

The programs of the School of Nursing include courses in the Summer Session. Persons desiring to enroll in courses to meet the requirements of the School of Nursing programs must be regularly enrolled students. Students who have been admitted with Advanced Standing and who may wish to make up deficiencies in the Summer Session must have courses approved by the School of Nursing. Information about required courses is published in the regular *Bulletin* of the School of Nursing. For further information write to the Dean of the School of Nursing, Duke University, Durham, North Carolina.

Divinity School Studies

The degrees of Bachelor of Divinity, Master of Theology, and Master of Religious Education are administered by the faculty of the Divinity School. A limited number of courses carrying credits toward these degrees is listed herein under the heading of Divinity School. Persons desiring credit toward one of these degrees must be regularly admitted to the Divinity School, and all courses listed for Divinity School credit must be registered and approved in the office of the Divinity School. Students should consult the *Bulletin* of the Divinity School for specific requirements for the various degrees offered. This school publishes its own Summer Session *Bulletin*, a copy of which may be secured by addressing The Office of the Dean, The Divinity School, Duke Station, Durham, North Carolina.

Graduate Study

Summer Sessions offer an excellent opportunity to advance or complete programs of graduate study already undertaken, to begin study toward a graduate degree at Duke University, to acquire graduate training useful in professional advancement, or to study for personal satisfaction. The several departments offer a variety of graduate courses, as listed in later pages, given by members of the Duke faculty and visiting professors. Especially full programs are provided in Botany, Education, English, History, Psychology, Sociology, and Zoology.

Postdoctoral Research

Scholars engaged in postdoctoral research find it advantageous and sometimes essential to use in summer the resources of the Duke University libraries. The University welcomes these visitors and makes available to them the living accommodations of the dormitories and the dining halls during the Summer Session, June 12 to August 25.

The Ph.D. and Ed.D. Degrees

Study for the Ph.D. Degree. Students who are interested in working toward a Ph.D. degree should note in detail the requirements as outlined in the Bulletin of the Graduate School of Arts and Sciences. Requirements for the Ph.D. include one academic year of full-time residence.

Study for the Ed.D. Degree. Students who are interested in working toward the Ed.D. degree or for advanced certificates for principals and supervisors should consult the detailed statement in the Bulletin of the Graduate School of Arts and Sciences. Requests for specific information regarding residence and programs for the Ed.D. degree should be sent to the Director of Graduate Studies, Department of Education.

The Master's Degree

Candidacy. As a candidate for a Master's degree (A.M., M.S., M.Ed., M.A.T., M.H.A.) the graduate student must (1) have made passing grades in all courses taken during the first period of residence (if he registers for fewer than 12 units of graduate courses during the first period of residence, he must make passing grades on the initial 12 units of graduate courses), (2) have made a grade of "G" or "E" on at least 3 units of this work, and (3) have received the approval of the major department (or in the case of the M.A.T. of the supervisory committee).

Time Limits for Candidates. A candidate for a Master's degree who is in residence for consecutive academic years should complete all requirements for the degree within two calendar years from the date of his first registration in the Graduate School. Any candidate must complete all requirements within six calendar years of his first registration.

Master of Arts

Language Requirements. The candidate for the A.M. degree must have a reading knowledge of at least one foreign language. (The several departments reserve the right to specify which foreign languages are acceptable.) The language requirement is met by successfully passing examinations as follows:

a. For French, German, and Russian students admitted in September, 1964 and thereafter take the Educational Testing Service examination given at the Duke University Counseling Center and elsewhere. Students who were admitted before September, 1964 may take either these examinations or the regular reading examination offered by the respective departments.

b. For Spanish the department reading examinations will be taken by all students.

c. For other languages, special examinations must be requested.

Major and Minor Subjects. As a prerequisite to graduate study in his major subject, the student must have completed a minimum of 12 semester hours of approved college courses in that subject, and 12 additional semester hours in that subject or in related work. Since some departments have specific requirements for undergraduate preparation, the student should read carefully the special requirements listed by his major department, which are included as headnotes to the course offerings in the Bulletin of the Graduate School.

To complete the course requirements for the A.M. degree, the student must take 24 units of graduate courses, of which at least 12 must be in the major subject. Of the remaining 12 he must take 6 units of course work in a minor subject, leaving 6 units of course work to be taken in either the major or minor field, or in another field approved by the major departments and the Dean of the Graduate School. In addition to the course work, the student must present a thesis which carries a credit of 6 units. Thus, the total credit required for the A.M. degree amounts to 30 units.

The Thesis. The thesis for the A.M. degree should demonstrate the student's ability to collect, arrange, interpret or report pertinent material on his special research problem. Although a publishable document is not required, the thesis must be written in a literate style, and should exhibit the student's competence in scholarly methods and procedures.

Regulations and Procedures. Students expecting to complete all requirements for a Master's degree should file with the Graduate School office not less than one month prior to first presentation of the thesis a declaration of intention to receive the degree and a thesis title. Candidates completing requirements for a Master's degree without thesis should file the same official blank one month prior to completion of all degree requirements. Official blanks may be obtained from the Graduate Office or from the Director of Graduate Studies in the student's major department.

Four typewritten copies of the thesis, in the spring binders provided by the Duke University Library, must be submitted, in approved form, to the Dean of the Graduate School at least *three days* before the date of the thesis examination. The copies will then be distributed to the several members of the examining committee.

The Examining Committee and the Examination. After consultation with the professor who has directed the thesis work, the Director of Graduate Studies in the major department appoints an examining committee composed of the director of the thesis as chairman and two other members of the graduate faculty, one of whom should represent the

minor department. The committee composition is subject to approval by the Dean of the Graduate School. The candidate appears before this committee for an examination, which lasts for about one and one-half hours. The subject matter covered in the examination is usually restricted to the thesis and to the major field.

If the candidate passes his examination, the examining committee certifies to this fact by signing the title page of the ribbon copy and first carbon copy of the thesis. The candidate then returns the original and first carbon copy of the thesis to the Dean of the Graduate School for binding and deposit in the University Library. The binding fee is \$5.00 a volume.

Master of Education

Prerequisites. The degree of Master of Education is granted ordinarily only to teachers or to others engaged in educational work.

Before a student is admitted to graduate study for this degree, he should have completed, on the undergraduate level, a minimum of

18 semester hours of approved work in Education.

Requirements for the Degree Without Thesis. The required work includes a departmental major (Elementary Education, Administration, Counseling, Secondary Education or Teaching the Emotionally Disturbed) of at least 12 units, and a minor of at least 6 units outside the Department of Education. The remaining 12 units are elective within the area of Education and the minor field, but require the approval of the student's major adviser and the Director of Graduate Studies.

Toward the end of his residence the student must pass a comprehensive examination on his departmental major. Permission to take such examination must be obtained from the Director of Graduate Studies of the Department of Education, and a notice of intention must be filed with him at least two weeks before the announced dates of the examina-

Requirements for the Degree With Thesis. Students who elect this plan are permitted to substitute a thesis for 6 units of the required course work. The thesis subject must be approved by the professor who is to direct it and by the Director of Graduate Studies. Students expecting to complete all requirements for a Master of Education degree should file with the Graduate School Office not less than one month prior to first presentation of the thesis a declaration of intention to receive the degree and a thesis title. Official blanks may be obtained from the Graduate Office or from the Director of Graduate Studies in the Department of Education.

In addition to the thesis, the student must present at least 24 units of course credit. Of these, 12 units must be taken in the student's departmental major. Six units, constituting a minor, must be taken outside the Department of Education. The remaining 6 units are elective within the area of Education and the minor field, but require the approval of the

student's major adviser and the Director of Graduate Studies.

The regulations concerning the writing and submission of the thesis, and the examination of it, are the same as those governing the thesis for the Master of Arts degree.

Master of Arts in Teaching

Prerequisites. The degree of Master of Arts in Teaching is designed for teachers already in service and for recent graduates of liberal arts colleges who wish to enter public school, private school, or junior college teaching.

A student should normally have completed a minimum of 12 semester hours in his proposed major subject and an additional 12 semester hours in that or related subjects. In the event that a student wishes to undertake a graduate major different from the undergraduate major, the prerequisites may be modified upon the recommendation of the student's committee and the approval of the Dean of the Graduate School.

Programs for the Degree. One of two programs may be arranged, in

consultation with the student's committee:

a. A major in Education of 18 to 24 units and 6 to 12 units in courses outside the Department of Education.

 A major in a department other than Education of 18 to 24 units and 6 to 12 units in Education.

In both programs a minimum of 30 units is required.

The courses outside the Department of Education are to be taken in one or more subjects ordinarily taught in the secondary schools. The amount and distribution of this work will be determined by the needs of the individual student.

The Master of Arts in Teaching may be earned with or without the presentation of a thesis. If a student, in consultation with his committee, elects to present a thesis, 6 units of the total of 30 units required will be allotted to thesis research. He will then be required to complete 24 units of course credits. The regulations concerning the writing and submission of the thesis, and the examination on it, are the same as those governing the thesis for the Master of Arts degree.

Candidates for the Master of Arts in Teaching who have not had teaching experience must major in Education and are required to take Education 215 (or 315) and 216, in which case a minimum of 36 units is

required.

The Committee. Each candidate for the degree will be assigned a committee, appointed by the Director of Graduate Studies in his major department, to plan his program of study.

This committee will consist of three members, at least one of whom will be from the Department of Education, and at least one from another

department. The chairman of the committee will normally be chosen

from the department of the major.

Cooperative Program in Teacher Education. Thirty-five to forty selected graduates of liberal arts colleges who desire to prepare for highschool teaching will be admitted to a special internship program at Duke University. This program is designed to prepare for a teaching career selected college graduates who did not prepare professionally for teacher certification as undergraduates. The Cooperative Program provides, for candidates who are chosen, graduate study in their special fields, professional courses, and carefully supervised observation and teaching experience. One who completes the program successfully can achieve within a period of fifteen months a year of teaching experience, a Master of Arts in Teaching degree, and full certification as a teacher.

Candidates will begin the program at the opening of the Summer Session of 1967 and complete it in August of 1968. They will spend the summer preceding and the summer following the year of teaching in residence at the University. During the school year 1967-1968 interns will be employed as regular teachers in a cooperating public school system. During this year they will receive full salary and will work under the joint supervision of the cooperating public school and the University. The program will meet training qualifications for the advanced, or graduate, teacher's certificate in many states. Participants in the program are expected to teach for a second year as fully certified teachers in the school in

which they complete the internship.

The salary for the year of teaching will, in effect, constitute a substantial award to candidates selected for the program. Interns will benefit from Duke University's special tuition rate for teachers. Applicants will be considered, as are candidates for other awards, on a competitive basis. The best-qualified applicants will be chosen on the basis of undergraduate record, recommendations, and evidence of interest in becoming highschool teachers. Applicants are required to arrange interviews in connection with their applications. Application forms may be secured by addressing a request to the Dean of the Graduate School and should be submitted before February 15, 1967. Details concerning the program can be obtained by writing the Director, Cooperative Program in Teacher Education, Department of Education, Duke University.

Master of Science

The degree of Master of Science is offered in the three fields of Engineering-Civil, Electrical, and Mechanical-and in Forestry.

Prerequisites-Engineering. As prerequisites to this degree, the student must have earned a Bachelor's degree from an accredited engineering college and have completed a minimum of 12 semester hours work in the major field.

Prerequisites-Forestry. As prerequisite to this degree, the student

must have earned a Bachelor's degree which represents an undergraduate program in forestry or an allied field.

Language Requirements. For the Master of Science degree no foreign

language is required.

Major and Minor Subjects—Engineering. The work for the Master of Science degree is designed to provide a broad foundation in the fields of civil, electrical, and mechanical engineering. The student must present acceptable grades for a minimum of 24 units of graduate courses: at least 12 in course work in his major area of concentration in engineering (not necessarily confined to the offerings of the engineering department in which the student is registered); a minimum of 6 units in a minor subject outside of engineering which lends broad support to his program (usually in mathematical or natural sciences); and the remaining 6 of the 24-unit course requirement in either the major or minor subject, or in an area approved by the major department and by the Dean of the School of Engineering. In addition to the 24-unit course requirement, the student must present a thesis, which carries a credit of 6 units. Thus his earned credit for the degree totals a minimum of 30 units.

Major and Minor Subjects-Forestry. The work for the Master of Science degree is designed to provide a broad foundation in forestry and allied fields. Course requirements are 12 units in forestry, a minimum of 6 units in a minor field outside of forestry, and the remaining 6 units in either the major or the minor field, or in another area approved by the Director of Graduate Studies in Forestry and by the Dean of the Graduate School. In addition to the 24-unit course requirement, the student must present a thesis which carries 6 units of credit. Thus his

earned credit for the degree totals a minimum of 30 units.

Thesis and Examination. The regulations and procedures for the thesis and the provisions for examination and an examining committee are the same as those for the Master of Arts degree.

Completion of Requirements for Degree on September 1

Candidates for degrees in the Graduate School of Arts and Sciences desiring to have their degrees conferred on September 1, must have completed all requirements for the degree as of the final day of the Duke University Summer Session. A candidate completing degree requirements after that date will have his degree officially conferred at the following June Graduation Exercises. (Transfer of credit for work completed at other universities must be recorded by September 15.)

Special and Cooperative **Programs**

Cooperative Programs

The long-standing reciprocal agreement with the Consolidated University of North Carolina (see Graduate School Bulletin) is now effective during the respective Summer Sessions of this University and the University of North Carolina. It is restricted to a graduate student who has registered for a full program during at least one semester of the preceding academic year. Such a student by enrolling in the home Summer Session and paying its normal fees may register for a maximum of 3 semester hours at the other institution upon payment of a nominal fee of \$2.00. Credit so earned is not defined as transfer credit.

Special Conferences and Courses

Special Programs for Teachers of Science and Mathematics

It is anticipated that the Summer Session will offer a number of special programs at the graduate level designed specifically for high-school teachers of science and mathematics. For detailed information on the programs, teachers should write Dr. Thomas Reynolds, Mathematics Department, Duke University, Durham, North Carolina.

Conference on School Law

A conference on school law will be held on Duke University campus on June 20-21. The program is planned for the benefit of administrators and teachers in schools and colleges. Speakers and consultants well known in the field of school law will participate in the two-day conference.

Duke University ABC Program

In the summer of 1967, Duke University will sponsor for the second consecutive year a program known as Project ABC (A Better Chance). This will bring to the campus for an eight-week period a group of approximately 98 boys, ages thirteen to sixteen, from culturally and educationally disadvantaged backgrounds. These students will participate in an intensive program in reading, English, and mathematics in preparation for their entrance in the fall to independent boarding schools. They will be chosen primarily by the ISTSP (Independent Schools Talent Search Program) and given scholarships from both the Federal government and private funds to attend private schools for the final two to four years of their high school education. It is hoped that with several years of good secondary schooling these youngsters will have a greater chance of success when they go to college. ISTSP is an organization created by a group of independent schools to seek out promising students from disadvantaged circumstances. Project ABC was established in order to assist those students chosen by ISTSP who, in spite of their ability and motivation, may be unprepared for the more difficult curriculum and for the way of life at boarding school. The Summer Session is designed to make the transition to boarding school easier and to determine whether or not a student is ready to proceed.

Modern Mathematics Workshop for Elementary Teachers

The Duke University Summer Session with the cooperation of the North Carolina State Department of Public Instruction will offer a two-week workshop in modern mathematics for elementary teachers, July 1–July 18.

The workshop will be instructional with emphasis on various topics of the content presently being stressed in the contemporary mathematics programs in the elementary grades. Participants in the workshop will be granted 2 s.h. credit for the workshop

Registration fee for the workshop is \$40.00 for public school teachers. There are *fifteen* \$40.00 scholarships available for North Carolina public

elementary teachers. For further information and application write to the Director of the Summer Session, Duke University, Durham, North Carolina.

NDEA Summer Institute in English

The Department of English, in cooperation with the Department of Education, will offer during Term I (June 12-July 18) an NDEA Institute in English for junior high school teachers who are presently teaching English courses but whose major teaching field is not English. The Institute will include instruction in Literature, Language, and Composition. The instruction will carry credit which may be applied to the renewal of a teaching certificate. The Institute will be limited to about 45 junior high school teachers. Preference will be given to applicants from areas east of the Mississippi. The deadline for submitting applications is March 22, 1967. For application blanks and further information write: Director, NDEA Institute in English, Box 7369, College Station, Durham, North Carolina, 27708.

Southeastern Institute of Medieval and Renaissance Studies

The Southeastern Institute of Medieval and Renaissance Studies has been established for the advancement of scholarship and the improvement of teaching in the southeastern region. Through the Institute the resources of Duke University and the University of North Carolinaparticularly library holdings-will be made available to scholars and teachers throughout the region. Students of all areas of medieval and renaissance studies will participate. The Institute will alternate annually between the campuses of Duke University and the University of North Carolina at Chapel Hill. The third session, from July 17 to August 24, 1967, will be held on the University of North Carolina campus.

Highlands Biological Station

Duke University holds a subscribing instructional membership in the Highlands Biological Station at Highlands, North Carolina, on the southern edge of the Blue Ridge Mountains at an elevation of 4,118 feet. The situation and the region offer an excellent opportunity for field studies and limited laboratory work. A limited number of qualified students in Botany and Zoology may make arrangements to carry out research at this station.

Medical Mycology

A month's course in Medical Mycology, under the direction of Dr. Norman F. Conant, is to be offered at Duke University School of Medicine and Duke Hospital, June 26–July 22, 1967. The course will be offered every day in the week, except Sunday, and has been designed to insure a working knowledge of the human pathogenic fungi within the time allotted.

Emphasis will be placed on the practical aspects of the laboratory as an aid in helping establish a diagnosis of fungus infection. Insofar as possible and as patients become available, methods of collecting materials in the clinic for study and culture will be stressed. Work with patients, clinical material, cultures, and laboratory animals will serve as a basis for this course. Also, an opportunity to study pathologic material, gross and microscopic, will be given those whose previous training would allow them to obtain the greatest benefit from a study of such material.

The enrollment for the course will be limited and the applications will be considered in the order in which they are received. An attempt will be made, however, to select students on the basis of their previous

training and their stated need for this type of work.

A fee of \$100.00 will be charged for this course, upon the completion of which a suitable certificate will be awarded. Please direct inquiries to Dr. Norman F. Conant, Professor of Microbiology, Duke University School of Medicine, Durham, North Carolina.

The Methodist Course of Study School

The nineteenth session of the short-term school for Methodist ministers taking the required Course of Study will be conducted during the period, July 10-August 4, 1967. While this School is designed primarily for Supply Pastors and other non-seminary candidates for the Methodist ministry, clergymen of any denomination may enroll. The curriculum, as approved by the 1964 Methodist General Conference will be followed, will include Studies for License to Preach, Introductory Studies and the Studies for the First, Second, Third, and Fourth Years.

In addition to class work, there is provision for daily worship and a number of special lectures and workshops. A varied program of recreation and athletics will be supervised by the University Department of Physical Education.

Registration is scheduled for July 10. Classes begin on the morning of July 11 and continue through August 4. A descriptive folder giving details of the School will be ready for distribution about March 1, 1967, and copies may be procured by writing to Professor W. A. Kale, Director, Box 4353, Duke Station, Durham, N. C.

Divinity School Summer Clinics

Summer Clinics in Church Planning and Development, Pastoral Care, Preaching, and Systematic Theology, and possibly other topics will

be held simultaneously July 17-28, 1967. These clinics are designed to supplement seminary education through two weeks of intensive training in one selected subject. Each has its own leaders and schedule. However, the several groups will be together for special features and lectures. Registration is open to ministers of all denominations. Participants are expected to attend the full two weeks from the opening dinner to the closing luncheon. No academic credit is given. Please address requests for information, costs, and financial aid to: Dr. M. Wilson Nesbitt, Director and Registrar, Box 4814, Duke Station, Durham. North Carolina.



Resources for Study

Libraries

The University libraries, with 1,783,803 volumes and 3,868,810 manuscripts, provide exceptional resources and facilities for study and research by undergraduate and graduate students and visiting scholars. They contain, in addition to books and manuscripts, microform copies of many thousands of rare books and long runs of newspapers and periodicals. About 70,000 volumes are added annually, while 150 foreign and domestic newspapers and 8,700 periodicals are received currently. Study facilities are provided for 269 graduate students in air-conditioned stacks of the General Library.

All libraries of the University are open for use throughout the summer. A "Student's Guide to the General Library" and a brochure on "The Library of Duke University" which describes the building and collections in general detail are available on request addressed to the Librarian of the University.

Laboratories

The laboratories in the various Science Departments (Botany, Chemistry, Physics, Psychology, and Zoology) are designed for both teaching and research. Ideal locations for special work in some of the sciences are available at Duke University Marine Laboratory at Beaufort, North Carolina; at Highlands Biological Laboratory at Highlands, North Carolina; in the Duke Forest at Durham, North Carolina; and in the Sarah P. Duke Gardens on the West Campus of Duke University.

Student Life

Living Accommodations

Summer Session students reside in resident facilities on West Campus of Duke University. Newly constructed air-conditioned residence halls will be available for undergraduate men and graduate and undergraduate women. Some units in Town House Apartments on Swift Avenue, opened for graduate women in the Fall of 1966, and a women's section in the Graduate Center will be available to graduate women. Graduate men will be assigned to the men's section in the Graduate Center near the Medical Center. Married graduate and professional students, with no more than two children, may rent apartments in Duke University Apartments on a space available basis.

Undergraduates, both men and women, are required to live in the residence halls unless they are married or living with parents or relatives. Any exception must be approved in advance by the Dean of Undergraduate Women or the Dean of Undergraduate Men, as appro-

priate.

The majority of residence hall rooms at Duke University are double rooms furnished for two persons. A limited number of single rooms are equipped for one person and are assigned in order of receipt of application with the required rental payment in the office of the Director of Housing. No double room in the air-conditioned section may be reserved for single occupancy. Double rooms in the non-air-conditioned

residence halls may be rented for single occupancy at the rates shown

on page 27.

Summer Session students who will be in residence at Duke University for both summer terms must so indicate on the Summer Session Housing Application and pay for both terms in advance. Those applicants who apply for housing for one term only but desire to remain for a longer period or those who fail to pay rent in advance for both terms at the time of application may be requested to move for the Second Term.

Assignment Procedures:

Undergraduate Men: Three sections of the air-conditioned residence halls will be reserved for undergraduate men. If additional spaces are required, one or more houses will be opened on the main quadrangle.

Undergraduate Women: Rooms in the air-conditioned residence halls

will be available for assignment to all undergraduate women.

Graduate Men: The men's section of the Graduate Center will be

available for graduate men.

Graduate Women: A section in the air-conditioned residence halls, spaces in Town House Apartments, and rooms in the women's section of the Graduate Center (not air-conditioned) will be available for graduate women. Priority for air-conditioned residences and apartment-type accommodations will be given to those graduate women applicants who apply for eight weeks or more of the Summer Session and make payment for the entire period of application.

If the type of accommodation for the first choice by a student is not available, another type of accommodation at a lesser cost will be as-

signed unless the applicant indicates otherwise.

Married Graduates: Graduate students who will be accompanied by their families and desiring to occupy family units in Duke University Apartments should write directly to the Director of Housing, Duke University, Duke Station, Durham, North Carolina, 27706.

Equipment:

Air-conditioned Residence Halls: Each student will be provided with a sofa-bed with cover, desk with chair, dresser with mirror, waste basket, and adequate closet space. Each room is equipped with draperies, carpeting, and wall book shelves. The student should provide a desk lamp, sheets, blanket, pillow, and other items desired. Beds measure 80 inches by 30 inches.

Non-air-conditioned Residences: Each student is provided with a 36 by 74 inch bed, dresser with mirror, desk with chair, and a bookcase. The student should provide a desk lamp, sheets, blanket, and pillow. An electric fan is recommended.

Town House Apartments: Each attractive, air-conditioned apartment is equipped for three women students, and includes living room, kitchen, master bedroom (2 students) with half bath, a single bedroom (one student), and a master bath with tub and shower. Housekeeping supplies, kitchenware, and linens must be provided by the occupants. It is recommended that two or three students apply to reside together in one of these units.

Duke University Marine Laboratory

The Duke University Marine Laboratory, located on Pivers Island adjoining the United States Bureau of Fisheries across the Newport River from Beaufort, North Carolina, has cottage-type residence halls which will be available for Summer Session students. All rooms in the Marine Laboratory residence halls are equipped for two persons. There is a separate building for dining and social activity. Double rooms will not normally be occupied as single rooms for the Summer Session. Reservations for rooms at the Marine Laboratory at Beaufort should be made with the Business Manager, Duke University Marine Laboratory, Beaufort, North Carolina, by submitting a Summer Session Residence Hall Application with your personal check for the amount of your room rent.

Dining Service

Food service is cafeteria style. The cost of meals runs from \$1.75 to \$2.00 per day, depending on the need and taste of the individual. Only the dining facilities on the West Campus will be used for the regular Summer Session students. The cafeteria in the Men's Graduate Center is usually not open in the summer.

Services Available

Medical Care

The Student Health Service, in the Duke Medical School Building, operates during the Summer Session and offers exactly the same medical and surgical services available to each full-time student during the academic year, as described completely in the Undergraduate Bulletin, but covers only six days of hospitalization in each term of Summer Session residence.

With the exceptions noted below, this service, under the direction of the University Physician, and with the cooperation of the staff of Duke Hospital, furnishes full medical and surgical care, drugs, dressings, x-ray work, and ward, but not special nursing, for any acute illness or injury, at no additional cost beyond the University fee for each term of residence or any shorter period. The cost of braces and necessary orthopedic appliances and of blood, as well as special nursing, must be borne by the student. A charge for meals (\$1.80 per day) will be made while the student is in the Hospital. All necessary telephone and telegraph charges will be borne by the student. If students have insurance providing hospitalization, surgical or medical benefits, these benefits shall be applied to the cost of their medical care. Refraction of eyes, treatment of teeth, and of all chronic and pre-existing conditions such as diseased tonsils, hernias, elective surgery, chronic skin conditions, endocrine disturbances, etc., or accidents or illness occurring during vacation or while off the campus are not included in this service.

No illness is treated in dormitory or other rooms occupied by students. Students needing treatment for minor medical or surgical conditions have the facilities of the Student Health Office in the Hospital between 9:00 a.m. and 4:00 p.m. on week days and from 9:00 a.m. until 12:00 noon on Saturdays. Emergency room care is available on Saturday afternoons, Sundays, and the 4th of July holiday. For admission to the Hospital, or for x-ray and consultation services, a student must present the 1967 Summer Session Student Identification Card as evidence that he is matriculated in the Summer Session and entitled to hospitalization. Students who register for 3 semester hours' credit, or for at least 1 hour

of research, are entitled to medical care without charge.

Appointments Office

The Appointments Office is maintained in Page Building the year around. The services of this Office are available without charge to students and teachers registered for a degree in Duke University and to school officials who may be seeking the services of new teachers. Students interested in securing employment through the Appointments Office should register with this Office.

The University Counseling Center

The University maintains a University Counseling Center which provides a centralized program of educational, vocational, and personal counseling for students. This confidential counseling service on problems of personal, social, educational, and vocational adjustment is provided without cost to students enrolled at the University. In addition, the Center administers special group testing programs for University schools and departments and serves as the local testing center for a wide variety of national testing programs. The Center also carries on programs of research in the field of measurement and counseling. Although the counseling, testing, and research services of the Center are designed

primarily to meet the needs of the students, the faculty, and the staff of Duke University, these services are made available to individuals and organizations outside the University as its facilities permit. Requests for further information should be addressed to the Director, University Counseling Center, Duke Station, Durham, North Carolina.

Student Activities

Religious Life

The Chapel, home of Duke University Church, interdenominational, is open all summer. The Church encourages the cultivation of the spiritual and moral life of students through participation in the service of worship which is held each Sunday morning at nine-thirty o'clock. The pulpit is occupied by a regular University preacher, or a special visiting preacher. Choral music for these services is provided by a volunteer student choir.

Recreation and Activities

The Summer Session will provide a varied program of entertainment and recreation. These plans include movies, presented once weekly by Quadrangle Pictures, weekly summer dances and open house social evenings with games for those who do not care to dance. Tours to areas of interest can be arranged for week-ends. Both the mountains and the seashore are easily accessible. Adequate facilities are available for those interested in swimming, tennis, and other sports. State clubs organized for the summer play an active part in all social activities.

Publications

During the Summer Session the University will publish each Saturday The Sundial, an official calendar announcing events-academic, social and recreational-of the following week. This calendar also includes official notices concerning academic requirements. Students are expected therefore to read The Sundial regularly.

Admission

Students in the following categories may be admitted to the Duke University Summer Session:

1. Graduates and undergraduates who are presently enrolled and in good standing in Duke University.

2. Graduates and undergraduates who have been formally admitted, or re-admitted, to Duke University.

3. Students who are currently in good standing at their respective institution and who have approval by the proper authority to take and transfer credits earned in the Duke Summer Session.

4. Teachers in service with or without the Bachelor's degree who wish to earn credits for certification purposes.

Admission to specific courses offered in the Summer Session is governed by the student's academic status (freshman, sophomore, junior, senior, graduate, special or unclassified) and by the prerequisites of the course in question.

Students in Residence at Duke University during the Spring Semester, 1967

A Duke University student, either graduate or undergraduate, who plans to attend the Summer Session should at the time of pre-registration for the fall semester (see p. 33 for specific dates) enroll for the

desired Summer Session courses. He need *not* file with the Summer Session the application blank at the end of this *Bulletin*.

Students Not in Residence at Duke University during the Spring Semester, 1967

Undergraduates. New students seeking to enter Duke University as freshmen or as undergraduates with advanced standing, and undergraduates who wish to re-enter the University should write the Office of

Admissions requesting application forms.

Undergraduates, both men and women, enrolled in other colleges and universities who desire to earn in the Duke University Summer Session credits which are to be transferred to their own institutions should apply directly to the Director of the Summer Session, Duke University, on the application form at the end of this *Bulletin*. They should give accurately and clearly all information called for on the application form.

Graduates. Students with graduate standing and teachers in service with or without the Bachelor's degree who wish to earn credits toward the renewal or the advancement of their certificate and who do not wish to become candidates for a degree at Duke University should apply to the Director of the Summer Session on the application form at the end of this *Bulletin*.

Graduate students who are seeking admission to the Graduate School of Arts and Sciences and those who have been admitted to the Graduate School must apply to the Director of the Summer Session on the application form at the end of this *Bulletin*. Those who are seeking admission to the Graduate School *must also file* Graduate School application forms which may be secured by writing to the Dean of the Graduate School, Duke University, Durham, North Carolina.

Students Not Seeking Admission to the Graduate School. Any student who holds an A.B. or B.S. degree and who does not intend to earn an advanced degree at Duke University but who desires graduate work for professional or other reasons should apply to the Director of the Summer Session for admission as an unclassified student. Credit earned by an unclassified student will serve all usual purposes except that it will not count toward an advanced degree at Duke University.

Students Seeking Admission to the Graduate School. Admission may be granted to a student who has received an A.B. or B.S. degree from an accredited institution after a four-year course of study. The undergraduate record should be well rounded and of such quality as to give evidence of real capacity for success in graduate study. A student who seeks admission should (1) secure an application blank from the Graduate School and promptly return it with the required information, (2) have mailed

directly from the registrar of each college he has attended to the Dean of the Graduate School at Duke University two copies of an official transcript of all his undergraduate or graduate work, (3) have mailed to the same official at least two, and preferably three, letters of recommendation from persons best qualified to appraise his capacity for graduate study. Special forms will be provided.

As additional evidence of capability scores on the Graduate Record Examination, particularly the Aptitude Test, and on the Miller Analogies Test are strongly recommended in all departments and must be submitted if either test has been taken. Scores on the Graduate Record Examination may be requested of any applicant whose record is marginal and must be submitted by all applicants for a fellowship. Departments that require scores of all applicants are listed below:

Departments	Graduate Record Aptitude	Examination Advanced	Miller Analogies Test
Anatomy	×	×	
Biochemistry	X	×	
Botany	X	X	
Chemistry	X	X	
Economics	X	× × × ×	
English	X	×	
Forestry	× × × × × × × × × × × × × × ×		
Geology	X		
Germanic Languages	X		
History	X		
Mathematics	X		
Microbiology	X	X	
Pathology	X		1
Philosophy	X	×	×¹ ×
Physiology	X	×	X
Psychology	X		
Political Science	X		
Religion	X		
Romance Languages	X	×	
Sociology	X	X	,
Zoology	X	X	×¹
¹ Either GRE or MAT.			

(Information on times and places of Graduate Record Examinations can be provided at the applicant's college or by the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.)

So that applications for admission to the Graduate School for summer work may be given full consideration, the student must submit all required documents to the Dean of the Graduate School at least ONE MONTH before the date of intended registration. No student may register with the Graduate School until his application has been completed and admission has been granted.

Postdoctoral Scholars

Application for these postdoctoral research privileges must be made in advance by letter to the Director of the Summer Session giving the applicant's present position, the specific field of his research interest, and the dates during which he desires to be in residence. Approved applicants will be accepted subject to the availability of library and of dormitory space.

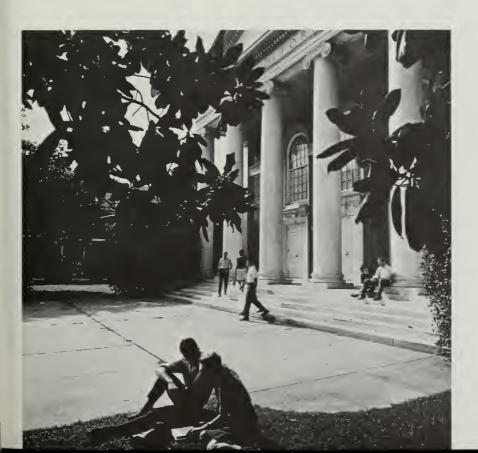
Admission to Degree Candidacy

Credits earned during the Summer Session may be applied toward

the requirements of a degree.

Undergraduates. A student seeking to enroll as a candidate for the Bachelor's degree from one of the colleges of Duke University must meet the entrance requirements set forth in the *Bulletin* of Undergraduate Instruction and be accepted by the Director of Admissions. This *Bulletin* may be secured by writing the Office of Admissions, Duke University.

Graduates. A student seeking to enroll as a candidate for one of the advanced degrees offered by the Graduate School of Arts and Sciences of Duke University must meet the requirements set forth in the Graduate School *Bulletin*. This *Bulletin* may be secured by writing to the Office of the Graduate School of Arts and Sciences.



Financial Information

Fees and Expenses

Fees

The University Fee. This fee, which covers registration, tuition, and medical care, is \$40.00 per semester hour for undergraduates, \$40.00 per unit for the Graduate School. Special fees have been established for:

1. Teachers in full-time service in elementary and secondary schools: \$20.00 per semester hour.

2. Divinity School students approved by the Dean of that School: \$20.00 per semester hour.

Laboratory Fees. (These where applicable are in addition to the University fee.) The fee for the Marine Laboratory is \$10.00 per course. For Marine Laboratory investigators' research table fees, see the Marine Laboratory Bulletin.

Medical Mycology Fee. This fee of \$100.00 replaces the University fee.

Master's Degree Summer Session Fee. A Master's candidate who submits his thesis when not registered for at least the 1-unit research-residence fee is required to pay a 1-unit fee of \$40.00.

Auditing Fees. (See p. 35 for definition.) These fees are as follows:

1. Students registered for a full course program may audit non-laboratory courses (with the permission of the Director) at no extra charge.

2. Students carrying less than a full course program may be granted permission to audit a course or courses on payment of half the University fee per semester hour audited: \$20.00.

Late Registration Fee. Students who fail to register prior to the first

class day of a given course will pay an extra fee of \$5.00.

Fee for Course Changes. Course changes other than those required by the University will be made only on payment of an extra fee of \$1.00 per change.

Fee for Make-up Final Examination. This fee is \$5.00.

Refund of Fees. Fees will be refunded under the following circumstances:

- 1. When applications for withdrawal are received by the Director of the Summer Session before the close of registration on registration day, full fees will be refunded.
- 2. When applications for withdrawal are received by the Director of the Summer Session during the first four class days of a given term, So per cent of the fees will be refunded.

3. When applications for withdrawal are received by the Director of the Summer Session after the fourth class day, there will be no

refund of fees.

Residence Halls Rates

Air-Conditioned*

Single		Do	uble	
10 weeks-\$	130.00		weeks-\$	
9 weeks–	117.00	9	weeks-	92.25
8 weeks-	104.00	8	weeks-	82.00
5 weeks—		5	weeks-	51.25
4 weeks-	52.00	4	weeks-	41.00
ı week —	13.00	1	week –	10.25

Not available for graduate men

Non-Air-Conditioned

Single	Double	Singles——
10 weeks-\$102.50	10 weeks-\$ 87.50	10 weeks—\$140.00
9 weeks- 92.25	9 weeks- 78.75	9 weeks— 126.00
8 weeks- 82.00	8 weeks- 70.00	8 weeks- 112.00
5 weeks- 51.25	5 weeks— 43.75	5 weeks— 70.00
4 weeks- 41.00	4 weeks— 35.00	4 weeks— 56.00
1 week - 10.25	1 week – 8.75	1 week — 14.00

Double Rooms used as

Town House Apartments (Graduate Women Only) \$21.00 each student per week (3 to an apartment) \$36.00 each student per week (2 to an apartment) (Not assigned for less than 5 weeks)

Duke University Marine Laboratory 5 weeks—\$43.75 Per Person

Application for room or apartment reservations at Duke University, accompanied by the full amount of the room rent for the application period, should be made to Director of Housing, Duke University, Duke Station, Durham, North Carolina. Rooms and spaces in apartments will be reserved in the order in which applications are received, and on certification of admission by the Summer Session Director. Notification of assignment to rooms will be made about May 30 for the First Term; about July 10 for the Second Term.

Rooms and apartments are available to applicants twenty-four hours prior to the registration for a specific term of the Summer Session. A room or apartment is to be vacated by the occupant within twenty-four hours after his final examination or agreement period. Any period of occupancy, other than for a specific term of the Summer Session, must be arranged with the Director of Housing, House D, Room 101R, Duke University.

Refund of Room Rent. Refunds are made under the following circumstances:

1. When notification for room eancellation is received by the Housing Bureau on or before fifteen (15) days prior to the registration date of the summer session term, full room rent will be refunded.

2. When notification for room cancellation is received between the fifteen (15) days prior to registration date and the first four class

days, 80 percent of the room rent will be refunded.

3. When notification for room cancellation is received after the first four days of a summer session term, 70 percent of the room rent for the unused period will be refunded.

Applicants should be sure to express their preference as to roommates, if they have a preference. If no preference of roommate is expressed the Director of Housing will assign a roommate; however, he does not assume responsibility in this matter.

Estimated Cost of One Term of Summer Session

University Fec, 6 s.h\$240.00
(Teachers, elementary and secondary, in full-time service pay \$120.00)
Dormitory Rooms (2 occupants, \$43.75 per person) 43.75

Meals (Cafeteria selective; average per day \$2.00)	72.00
Books and Class Materials \$7.00 to \$10.00	8.50
Miscellaneous (laundry, etc.)	12.00
Total (elementary and secondary teachers in full-time service	
deduct \$120.00)\$	376.25
(The total estimated cost will vary with the type of housing sele	cted.)

Student Aid

Special Fees To Teachers

Teachers in full-time service in elementary and in secondary schools, who are accepted by the Summer Session, pay only \$20.00 per semester hour. Teachers on leave of absence from their schools and teachers not currently employed are not eligible for this special fee.

Scholarships for Public School Personnel

Duke University will offer thirty-six special scholarships of \$150.00 each to high school and elementary teachers on a competitive basis (not by a written examination) for the Summer Session of 1967. This scholarship program is designed to encourage teachers to begin or to continue their graduate studies leading to the A.M., M.Ed., or M.A. in Teaching degree.

Duke University will again offer six special scholarships of \$200.00 each to high school and elementary administrators and supervisors. This scholarship program is designed to encourage principals and supervisors to continue their graduate studies leading to advanced degrees.

Although successful applicants for the scholarships will not be required to become candidates for a degree, they must qualify for and receive admission to the Graduate School of Arts and Sciences.

All applications with supporting documents must be submitted by April 1, 1967. Selection and appointment of scholars will be completed by May 1, 1967.

Application blanks and complete information may be obtained from the Director of the Summer Session, Duke University, Durham, North Carolina.

Loans

A number of loan funds have been established for the benefit of the students of Duke University. Several of these funds are available to students enrolled in the Summer Session. Students enrolled in the Summer Session only are not eligible. These funds are administered through a committee of officers of the University.

The Committee, in approving loans, selects those students who, from the standpoint of character, scholastic attainment, and degree of financial

need, are deserving of consideration.

Applicants for loans should make application to the Manager, Student Loan Office, Duke University. All applications must be initiated during the first week of each term. The granting or withholding of a loan is a matter entirely within the discretion of the Student Loan Committee. A student is expected to use all other possible means of securing financial

assistance before applying for aid from a loan fund.

National Defense Education Act Loans. A limited number of loans may be made, under the provisions of the National Defense Education Act of 1958, to students in the Summer Session who have been regularly enrolled in the University prior to the Summer Session. A student who is enrolled for study in the Summer Session only is not eligible for consideration. Students pursuing the M.A.T. Cooperative Program are not eligible. Inquiries concerning opportunities available under this program should be addressed to the Manager, Student Loan Division, Duke University.

Remission of Tuition

Children of ministers who are members of the North Carolina and Western North Carolina Conferences of the Methodist Church are entitled to a remission of the tuition charge as are the children of ministers of all faiths residing in Durham County, North Carolina. This consideration is given only to the children of resident members of the two North Carolina conferences who are giving their full time to religious work. Only those students enrolled in a regular undergraduate program leading to a baccalaureate degree from Duke University are entitled to this benefit. Students in this group are entitled to a maximum of eight semesters of free tuition at the undergraduate level. Application for this benefit should be made to the Director of Financial Aid, Duke University.

Tuition Grants

Tuition grants are available to children of qualified staff members of Duke University. Information regarding the tuition grant program may be obtained by writing to the Director of Financial Aid, Duke University.

University Registration and Regulations

Definition of Terms

Registration. A student has completed registration for the Summer Session when:

- 1. His course program has been written and approved by the dean of the school or college in which he is enrolled or by the Director of the Summer Session in the case of the special or unclassified student.
- 2. Summer Session forms have been completed properly by the student in the Summer Session Office.
- 3. Summer Session University fees have been paid. A place in a course cannot be assured until fees have been paid. Tuition bills are not sent to the student's home.

Pre-enrollment. The term pre-enrollment refers only to the writing of the course program and its approval by the proper authority or by the Director of the Summer Session in the case of the special or unclassified student. **Pre-enrollment alone does not constitute registration**.

General Registration

Classes Beginning June 13. All Summer Session students whose classes begin on June 13, Term I, who do not complete registration in the Sum-

mer Session Office, 119 Allen Building, on or before June 5 *must* present themselves at general registration in the Summer Session Office. 119 Allen Building, on June 12 to register. Students will register during 30-minute periods alphabetically according to *surname* as indicated in the following table.

Time	Registrants (Surname)
8:30- 9:00	А-В
9:00- 9:30	C–E
9:30-10:00	F-H
10:00-10:30	I–L
10:30-11:00	Mc-N
11:00-11:30	O–P
11:30-12:00	Q–R
12:00-12:30	S-T
12:30- 1:00	U –Z

Classes Beginning June 19. All Summer Session students whose classes begin on June 19, Term I, must complete registration in the Summer Session Office, 119 Allen Building, on or before June 17.

Classes Beginning July 21. All Summer Session students who wish to register for courses offered during Term II or for research during Term II may register in the Summer Session Office on July 5 through July 18. All students who do not register for second term during this period must register in the Summer Session Office, 119 Allen Building, on July 20, between 8:30 a.m. and 1:00 p.m.

Classes Beginning on Other Dates. All Summer Session students registering for courses beginning on dates other than those specified above must complete registration in the Summer Session Office before the date on which their classes begin. Registration on the day on which classes are scheduled to begin will be considered late registration.

Late Registration

Any student who fails to register on or before the dates specified in the preceding paragraphs will be charged a fee of \$5.00 for late registration. No student will be permitted to register for a 3 semester hour course after the third class day (June 15, Term I; July 23, Term II); a 4 semester hour course after the second class day (June 20, Term I; July 22, Term II). Changes in courses other than those required by the University will require a payment of \$1.00 for each change made. All changes must be approved by the dean of the school or college in which the student is enrolled or, in the case of the special or unclassified student, by the Director of the Summer Session. Changes in courses

may be made within the first three class days. These registration rules are enforced rigidly.

Since Summer Session courses present a program of study in more concentrated and rapid form than in the regular semesters, students are advised to register on time and to be present at all class sessions.

Advance Registration

Students in Residence at Duke University during the Spring Semester, 1967

Writing Course Programs in the Schools and Colleges. Students in residence at Duke University during the Spring Semester, 1967, both graduate and undergraduate, who plan to enroll for courses offered in the 1967 Summer Session or to carry on research during the period of the Summer Session will write course programs and have them approved in their respective schools or colleges during the week of pre-registration, April 10-13, 1967. Graduate students will pre-register on April 12-13. Divinity School students will pre-register on April 13-14.

Advance Registration in the Summer Session Office. Students in residence whose course programs have been written and approved by their respective colleges on the dates indicated above may complete their registration in the Summer Session Office, 119 Allen Building, on the fol-

lowing dates:

Graduate and undergraduate students-May 10 through June 5 Registration in the Summer Session Office includes:

- 1. Completion of various Summer Session forms.
- 2. Payment of University fees.

A student who registers with the Summer Session Office during this period will not be required to be present at general registration on June 12. He will begin his class work on the date his classes are scheduled to begin: June 13 or June 19.

Students Not in Residence at Duke University during the Spring Semester, 1967

Advance Registration by Mail. Students not in residence at Duke University during the Spring Semester, 1967-new undergraduate students seeking to enter as degree candidates, graduate students who are not candidates for an advanced degree at Duke University, graduate and undergraduate students of other colleges and universities desiring to earn credits for transfer, public school teachers and college teachers (not advanced degree candidates)-may register by mail. Advance registration by mail includes:

1. Completion in full of the application form at the end of this Bulletin.

 Admission to the Summer Session by the Director of the Summer Session and, in the case of students seeking to enter Duke University as degree candidates, admission by the Admission Directors to the school or college of Duke University concerned.

3. Completion in full and return of forms required by the Summer

Session Office by June 5.

4. Payment of University fees by June 5. A student may *pre-enroll* by mail without paying the University fees but he *cannot register in advance* without doing so.

Students who complete registration by mail on or before June 5

need not be present at the general registration on June 12.

Degree Candidate Graduate Students Not in Residence during the Spring Semester, 1967. All graduate students not in residence during the Spring Semester, 1967, who are candidates for an advanced degree in the Graduate School of Arts and Sciences of Duke University must present themselves for registration in the Summer Session Office, 119 Allen Building, on June 12. They cannot complete registration by mail because:

- 1. Their program of study for the summer must be approved by their Director of Graduate Studies.
- 2. Their course programs must be written and approved by the Graduate School of Arts and Sciences.

These students may pre-enroll by mail with the Summer Session Office and may pay their fees in advance, but they cannot complete their registration.

Registration of Graduate Students

Graduate students in residence during the spring semester will preregister for either or both terms of the Summer Session on April 12–13. Other students who have been admitted to the Graduate School should present themselves for registration at the official registration period, June 12 for the first term, and July 20 for the second term. They are required to register both with the Summer Session and the Graduate School.

Graduate students resident in the spring semester who intend to remain in residence during either or both of the two Summer Session terms without registering for course work or research must register for one unit (one semester hour) to cover the cost of medical care and the use of University facilities. This one unit (one semester hour) of registration will entitle students to use the Student Health Service and University facilities during both terms of the Summer Session. The Master's candi-

date who has completed all requirements except submission of the thesis and who so registers is not charged any separate fee for submitting the thesis.

Academic Regulations

Kinds of Course Enrollment

Summer Session courses may be taken for "credit" or for "non-credit" or may be "audited." A student's program may be exclusively in one of these categories, or may combine any two of them or all three. Students taking a full or partial program for "credit" may enroll as auditors or as non-credit students in any number of additional courses.

Credit. The Summer Session term "credit" does not mean degree credit at Duke University unless the student has been admitted as a degree candidate by one of the colleges or schools of the University. A student taking a course for credit is expected to do all the work required and to take the final examination, and he will receive a grade. G.I. Bill benefits are available only to those veterans who enroll for credit.

Non-credit. "Non-credit" enrollment is available to the student who wishes the privilege of participating in class discussions, exercises, and the laboratory assignments but does not wish to take the examinations, either mid-term or final. A "non-credit" student may do as much of the work of the course as he desires, but he may not take the final examination and he will not receive a grade. Full fees of \$40.00 per semester hour are required in "non-credit" enrollment.

Audit. An auditor is entitled to listen to lectures and class discussions, but he may not participate in discussions or take examinations. Students may not enroll as auditors in laboratory courses. A student carrying a full program for credit may be given permission to audit as many courses as he desires without additional fees. Students carrying less than a full program for credit may secure permission to audit but are required to pay the auditing fee of \$20.00 per semester hour.

Credits

The Summer Session courses are of the same quality and credit values as courses in the regular semester. Credit earned in the Summer Session is in terms of semester hours. The majority of Summer Session courses carry 3 semester hours' credit and require one term in residence. A limited number of basic courses in the sciences carry 4 s.h. credit (Chemistry, Geology, Physics, Zoology).

Credits for Transfer. A student desiring either graduate or undergraduate credits transferred from Duke University to his university or college

as degree credit must request from the Director of the Summer Session, Duke University, a "Course Approval Form" to be completed by the student's Dean or Registrar and returned to the Director of the Summer

Session, Duke University.

Transfer of Graduate Credits. Under certain circumstances a maximum credit of 6 units in a Master's degree program may be allowed for graduate courses completed elsewhere. Approval for the transfer of credits will not be given until the student has spent one semester or two terms in residence. The acceptance of credit up to this amount will not reduce the minimum period of full-time registered residence at Duke University. In no case will credit be allowed for extension or correspondence courses.

With the approval of both the student's major department and the Dean of the Graduate School, a student who is granted such transfer for credit may be permitted to register for as much as 12 units for thesis research instead of the usual 6 units. Or he may be permitted to fill out his schedule with as much as 6 semester hours of further undergraduate training or 6 semester hours of required language courses on the undergraduate level.

For regulations concerning applying graduate credit earned elsewhere

to a graduate program here, consult the Graduate School Bulletin.

See page 11 for information concerning reciprocal agreement with

the Consolidated University of North Carolina.

Professional Credits Toward Teacher's Certificates. Professional credits toward teacher's certificates are granted by the various state boards of education, each in accordance with its own carefully planned rules. Teachers in service, before enrolling for certification credit, should consult the rules laid down by their State Board of Education. If necessary, they should send to their State Board of Education a list of the courses in which they plan to enroll and inquire whether these will be acceptable for certification credit.

The Normal Course Program

The normal and maximum program for one term of the Summer Session is 6 semester hours, except in cases where students take a 4 semester hour language course. In those cases 7 semester hours per term will be allowed. The 4 semester hour courses in the sciences run for four weeks and one such course constitutes a full course program. Four semester hour courses in the sciences do not meet on Saturday.

Grading

Only a student taking a course for credit will receive a grade. The grade given represents the quality of the work done in the course.

Passed.

Undergraduate Grades

A-excellent B-good

C-average

D-poor but passing

Graduate Grades

E-exceptional

G-good

S-satisfactory

Failed. A grade of F indicates that the student has failed the course, and in order to receive credit for the course he must repeat the work in class

Incomplete. A grade of I may be reported by the instructor if for any reason he is unable to report the final grade at the regular time. Incomplete courses must be completed before the close of the succeeding semester; otherwise the I is recorded as F, and the course must be re-

peated in class if the student is to receive credit for it.

Absent from Final Examination. The grade X indicates that the student was absent from the regularly scheduled examination. A student absent from examination, if the absence has been excused by the dean of the college or school in which he is enrolled or, in the case of the special or unclassified student, by the Director of the Summer Session, may receive an examination upon the payment of \$5 to the Treasurer of the University. The instructor concerned arranges for the examination in cases where absences are excused. A student with an X grade who has not obtained a passing grade before the end of the semester following that in which the X was incurred is regarded as having failed in the course concerned and must repeat the work in class in order to receive credit. If a student's absence from an examination is not excused by the dean of the college or school in which he is enrolled or, in the case of the special or unclassified student, by the Director of the Summer Session, his grade for the course concerned is recorded as F.

Examinations

Final examinations in courses are held on the last two days of each term. Final examinations for short courses which occupy the student's complete program will be held on the last day of the course. The examination dates for 1967 are:

First term: July 17, 18. Second term: August 24, 25.

Courses in science for the first term have been scheduled so that their final examination will come on July 18. The science courses which begin July 21 and run for four weeks will have their final examination on August 17. The University has no provision for giving examinations in absentia. Students absent from examinations for valid reasons are permitted a liberal extension of time to return to the University for completion of credit.

Dropping of Courses

If a student drops a course without permission from the dean of the school or college in which he is enrolled or, in the case of the special or unclassified student, the Director of the Summer Session, the grade for that course is recorded as F. If he drops a course with permission, the grade for that course is F unless, in the judgment of the dean or director, circumstances do not justify this penalty.

Withdrawal from the Summer Session

If a student wishes to withdraw from the Summer Session, he must notify both the dean of the school or college in which he is registered and the Director of the Summer Session.

Other Regulations

Motor Vehicle Registration

Students enrolled in the Summer Session must register their motor vehicles with the Traffic Office, o8 Social Science, West Campus.



Courses of Instruction

Eligibility for Course Enrollment

Courses numbered 1-49 are primarily for freshmen, or freshmen and sophomores. Courses numbered 50-99 are ordinarily for sophomores, or sophomores and juniors. Courses numbered 100-199 are designed for juniors and seniors. Courses numbered 200-299 are planned for seniors and graduates. Courses numbered 300 up admit graduate students only. Courses numbered from 200 up are limited in enrollment to 25 students.

Minimum Enrollment Required for Courses

All courses are offered subject to minimum enrollments. The University reserves the right to withdraw undergraduate courses in which fewer than twelve students enroll, senior-graduate courses numbered 200-299 in which fewer than ten students enroll, and graduate courses and seminars numbered 300 or above in which fewer than six students enroll. In withdrawing a course, the University attempts to avoid undue hardships on students. Sometimes, therefore, courses are offered in spite of small enrollments. Courses not listed will be given when a demand develops and an instructor is available.

Department Officers and Regulations

Departments offering Summer Session programs are listed alphabetically. Under each department is given the name of the chairman, of the director of graduate studies, and of the director of undergraduate studies. Where departments have set up special regulations for admission to candidacy for the Master's degree, these are included.

Botany

Professor Terry W. Johnson, Jr., Chairman (141A Biological Sciences Building, West Campus); Professor W. Dwight Billings, Director of Graduate Studies (061 Biological Sciences Building, West Campus); Associate Professor Robert L. Wilbur, Director of Undergraduate Studies (265A Biological Sciences Building, West Campus)

Students admitted to candidacy for an advanced degree in botany should have completed a minimum of 12 semester hours of courses in botany (or biology) beyond an elementary course, and related work in biological sciences. Students who have not yet had the minimum hours, however, may enter higher courses by permission of the instructor, if he is convinced that they can carry the work for undergraduate credit, and may count such work toward hours necessary for candidacy.

First Term (Duke Campus)

225. Special Problems. Hours to be arranged. Staff 350. Research. Hours to be arranged. Staff

First Term (Duke Marine Laboratory, Beaufort, North Carolina)

211 (Beaufort). Marine Phycology. An introduction to marine algae: their identification, taxonomy, morphology, physiology and ecology. Field trips complemented by laboratory study, culturing, and preparation of herbarium material. 6 s.h. Searles

225. Special Problems. Hours to be arranged. Searles

359. Research. Hours to be arranged. Searles

Second Term (Duke Campus)

226. Special Problems. Hours to be arranged. Staff 360. Research. Hours to be arranged. Staff

Second Term (Duke Marine Laboratory, Beaufort, North Carolina)

220. Coastal Field Botany. Survey of the regional flora with attention to ecological associations of the Beaufort area. Daily field trips for collection and intensive study of the rich vascular flora. Prerequisite: One year of college biological science. 6 s.h. Wilbur

Chemistry

Professor Charles K. Bradsher, Chairman (114 Chemistry Building, West Campus); Associate Professor Louis D. Quin, Director of Graduate Studies (og Chemistry Building, West Campus); Assistant Professor James F. Bonk, Director of Undergraduate Studies (107 Chemistry Building, West Campus)

All classes in Chemistry, Term I, will begin on June 19 and continue through July 18. All classes in Chemistry, Term II, will begin on July 21 and continue through August 17. Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see General Registration on page 31 of this Bulletin. (Chemistry classes will not meet on Saturdays.)

First Term

- 1. General Inorganic Chemistry. Lectures, recitations, and laboratory work on the elementary principles of chemistry and on the occurrence, preparation, properties, and uses of the elements and their compounds. Laboratory daily, 9:30-12:00; recitation and lecture daily, 12:45-2:45. 4 s.h. Bonk
- 61. Fundamentals of Analytical Chemistry. A study of the relations of electrolytes in solution and of chemical equilibrium illustrated by laboratory experiments involving the techniques of gravimetric, volumetric, and colorimetric analysis. Prerequisites: Chemistry 1-2 and Mathematics 21 or equivalent. Lecture or recitation daily, 8:30-10:00; laboratory daily, 10:30-12:30 and 1:30-4:00. 4 s.h. Toren
- 151. Organic Chemistry. An introduction to the study of carbon compounds. Compounds of the aliphatic series form the basis of lectures, discussions and laboratory experiments. Prerequisite: Chemistry 61. Recitation daily, 8:00-9:00; laboratory daily, 9:00-12:00; lecture daily, 12:00-1:00. 4 s.h. Brown
- 275. Thesis Research. Research in the fields of physical, analytical, inorganic, or organic chemistry. Open to those students whose research programs for the A.M. and Ph.D. degrees have been approved by the department and by one of the instructors in charge of the course. Schedule to be arranged. (Not more than one semester hour of credit per week for full-time schedule or one semester hour each two weeks for half-time schedule.) 2 to 8 s.h. Available Terms I and II.

Second Term

2. General Inorganic Chemistry. A continuation of 1. Prerequisite: Chemistry 1. Laboratory daily, 8:30-10:00; recitation daily, 11:00-12:00; lecture daily, 12:00-1:00. 4 s.h. Palmer

152. Organic Chemistry. A study of compounds of the aromatic series and of carbohydrates and proteins. Prerequisite: Chemistry 151. Recitation daily, 8:00-9:00; laboratory daily, 9:00-12:00; lecture daily, 12:00-1:00. 4 s.h. Kilgore

Classical Studies

Professor Lawrence Richardson, Jr., Chairman (312 Carr Building, East Campus); Assistant Professor D. Keith Stanley, Director of Undergraduate Studies (111 Language Building, West Campus)

Greek

First Term

121. Greek Literature: Homer—Iliad and Odyssey. The purpose of this course is to give a general survey of the life and civilization of the Greeks, especially to those who have never studied the language but wish to become acquainted with some of the choicest portions of the literature by the use of translations. The Iliad and the Odyssey are read in translation, and the excavations and discoveries at Troy and other cities of the Aegean age are discussed. 7:40-9:00. 3 s.h. Stanley

122. Greek Literature: The Tragic Poets. The purpose of this course is similar to that of course 121. Many of the extant plays of Aeschylus, Sophocles, and Euripides are studied in English translations. 9:20-10:40.

3 s.h. Stanley

Latin and Roman Studies

First Term

91. Introduction to Latin Prose and Poetry I. Introduction to the reading of Latin as literature with particular emphasis on form and style. The course, together with Latin 92, is designed to broaden the student's acquaintance with the range of Latin literature by introducing him to new forms and by showing him the relation of important works of Latin literature to one another, to increase his speed and facility at reading, and to provide a firm basis for the future study of the Roman achievement. The works studied are the poems of Catullus and the Pro Caelio of Cicero. 7:40-9:00. 3 s.h. Wooley

92. Introduction to Latin Prose and Poetry II. The companion course to Latin 91. The works studied are the Odes of Horace and the historical

writings of either Sallust or Livy. 11:00-12:20. 3 s.h. Wooley

111. Roman Literature in English Translation. Selected readings of Latin literature in English translation with emphasis on the drama, lyric poetry, and the varied contributions of Cicero to literature. 9:20-10:40. 3 s.h. Womble

112. Roman Literature in English Translation. Selected readings of Latin literature in English translation with emphasis on the epic, the satire, and the novel. 11:00-12:20. 3 s.h. Womble

Comparative Literature

First Term

191. Independent Study. Directed reading and research. Open only to qualified students in the junior year, by permission of the Department. 3 s.h. Salinger

193. Independent Study. Directed reading and research. Open only to qualified students in the senior year, by permission of the Department.

3 s.h. Salinger

205. Foundations of Twentieth-Century European Literature. The roots of the contemporary scene (Proust, Mann, Rilke, Kafka, Eyvind Johnson, Anouilh, Lagerkvist, Camus) evolving toward a mythology of man. 11:00-12:20. 3 s.h. Salinger

Divinity School

Professor Robert E. Cushman, Dean of the Divinity School (124 Divinity School, West Campus)

First Term

101(DS). Post Exilic Prophecy. A study of the post-Exilic prophets from Ezekiel to Daniel, with special reference to messianic prophecy and related Theological problems. 9:20-10:40. 3 s.h.

121(DS). Sacraments in the Christian Church. Ecumenical studies in devotion and division: Baptism and the Lord's Supper. 11:00-12:20. 3

Grislis

171(DS). Introduction to Pastoral Counseling. Intensive consideration of pastoral counseling structure and process. 7:40-9:00. 3 s.h. Williamson

107(DS). The Church in the New Testament. An exegetical consideration of the important New Testament texts relevant to the development of church order, ministry, sacraments, and/or other important dimensions of the primitive community and its self-consciousness. $9:20-10:40.\ 3 \text{ s.h.}$ M. Smith

174(DS). Religion and Personality Processes. Psychological and religious interpretation of man's basic experiences; personality factors in

religious belief and practice. 7:40-9:00. 3 s.h. Goodling

Economics

Professor Robert S. Smith, Chairman (306 Social Science Building, West Campus); Professor William P. Yohe, Director of Graduate Studies (313 Social Science Building, West Campus); Associate Professor Juanita M. Kreps, Director of Undergraduate Studies (302 Social Science Building, West Campus)

First Term

51. Principles of Economics. A course in the essential principles of economic science. (Credit for Ec. 51 will not be given until Ec. 52 has been completed.)

been completed.) 9:20-10:40. 3 s.h. Condos

138. Business Statistics. A survey of the principal statistical methods and their application to economics and business administration. The course deals with collection of statistical data, construction of statistical tables and charts, and a brief study of the fundamental statistical concepts and techniques. 11:00-12:20. 3 s.h. Reed

153. Money and Banking. The lender's side of financial markets. The activities of commercial banks and other financial institutions in supplying loanable funds and the effects of these activities on the money supply and its rate of use, the impact of central bank and Treasury operations on financial markets, and the evolution of the present monetary system and

its institutions. 9:20-10:40. 3 s.h. Yohe

154. Aggregative Economics. Concepts and measurement of national income and expenditures, employment, and price levels; the theoretical determination of these aggregates; and applications of macro-economic theory to business cycles and economic growth. 7:40-9:00. 3 s.h. Condos

287. Public Finance. An analysis of the impact of governmental expenditures, revenues, and debt on the allocation of resources, the redistribution of income, and the stabilization of income. 9:20-10:40. 3 s.h. Davies

318X. Thesis Seminar.

Second Term

52. Principles of Economics. A continuation of Economics 51. 9:20-

10:40. 3 s.h. Finger

146. Managerial Economics. Economic analysis of the business firm, its goals, and the economic environment of business. Economic theory of the firm; various mathematical models of the firm; the internal decisionmaking processes. No credit for those who have completed Economics 149. 7:40-9:00. 3 s.h. Vernon

149. The Theory of the Firm. Cost and supply considerations in price theory, the demand for factors of production. The allocation of resources is examined in the context of competitive and monopolistic market

structures. 9:20-10:40. 3 s.h. Vernon

265. International Trade and Finance. A study of fundamental principles of international economic relations. Subjects covered include the economic basis for international specialization and trade, and the economic gains from trade, the balance of international payments, problems of international finance, of international investments, and international monetary problems. 11:00-12:20. 3 s.h. Finger

318X. Thesis Seminar.

Education

Professor Roland H. Nelson, Chairman (o8D West Duke Building, East Campus); Professor Edward C. Bolmeier, Director of Graduate Studies (08B West Duke Building, East Campus); Professor W. A. Stumpf, Director of Undergraduate Studies (09A West Duke Building, East Campus)

Duke University is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers and school service personnel with the Doctor's degree

as the highest degree approved.

For admission to candidacy for the Master of Arts (A.M.) degree with major in Education, or for the Master of Education (M.Ed.) degree, students must, in addition to meeting the general requirements for admission to the Graduate School, meet the following specific requirements: Credit for (1) eighteen semester hours of acceptable prior work in Education and (2) twelve semester hours of acceptable prior work in a minor field. If Psychology, Sociology, Economics, or Political Science is chosen for the minor, six semester hours of work completed after entering the junior year in college will be accepted.

The degree of Master of Arts is available in the divisions of School Administration and Supervision, Secondary Education, Elementary Education, and Guidance and Counseling. Every candidate for the Master

of Arts degree in the Department should elect at least twelve semester hours in one of these divisions in which he plans to write his thesis and the remainder of his work, including the six semester hours in his minor, with the approval of the proper division adviser. The degree of Master of Education is available in the divisions of School Administration and Supervision, Secondary Education, Elementary Education and the Teaching of Emotionally Disturbed Children. Mr. Bolmeier, Mr. Hurlburt, Mr. Nelson, and Mr. Stumpf are advisers to students in School Administration and Supervision; Mr. Petty, Mr. Sublett and Miss Rudisill are advisers in Elementary Education; Mr. Bolmeier, Mr. Cartwright, Mr. Githens, and Mr. Shuman are advisers in Secondary Education; and Mr. Colver, Mr. Gehman, and Mr. Weitz are advisers in Guidance and Counseling. Mr. Cartwright and Mr. Hurlburt are advisers for the Master of Arts in Teaching program. Candidates for the Master of Arts, Master of Education, or Master of Arts in Teaching degree should read with special care the regulations of the Graduate School as set forth on pages 5-9. Candidates for the Master of Arts in the field of guidance should consult the special brochure on guidance available from the Dean of the Graduate School.

It is the intention of the Department to make available to degree candidates all courses ordinarily required for certification as graduate teachers, counselors, principals and superintendents. These courses will normally be offered at least once every three years.

First Term

107. Elementary Education: Arithmetic. The processes, methods, and materials basic to the teaching of arithmetic in the elementary school. Required in the elementary-education major. (July 1-July 18.) 11:00-12:20 plus Monday and Wednesday, 2:00-4:00. 2 s.h. Sandefur

(Persons participating in the Contemporary Mathematics for Ele-

mentary Teachers' Workshop will also participate in this course.)

204. The School as an Institution. Consideration is given to the place of the school in the American social order, and its adaptation to the social, economic, and political changes. Special attention is directed to the responsibility (1) of the school for seeking solutions to the perplexing problems of youth created by a changing society; and (2) of the government for providing greater equality of educational opportunity. 9:20-10:40. 3 s.h. Nelson

211. The Problem Child (also Psychology 211). Study of problem behavior and adjustment in children with emphasis on the causes and treatment of conduct and neurotic disorders of the maladjusted child. Particular attention will be paid to mental hygiene principles in the handling of problem children in school and home. 9:20-10:40. 3 s.h. Gehman

213. Elementary-School Organization and Administration. This course is designed especially for principals, teachers, and other prospective mem-

bers of the elementary-school staff. The scope of elementary education is considered to encompass nursery school, kindergarten, and the elementary school. Special treatment is given to the problems of internal organization and management of the elementary school, and its integration with the secondary-school level. 11:00-12:20. 3 s.h.

217. The Psychological Principles of Education. An advanced study of teaching, learning, and the learner. Selected problems guiding the reading of students will be discussed in class. 11:00-12:20. 3 s.h. Engle-

232. Supervision of Instruction. A survey of supervision as a means of improving instruction and adapting the curriculum to the learner and to community needs. 9:20-10:40. 3 s.h. Hurlburt

235. The Nature, Function, and Reorganization of the Curriculum. Selected problems guiding the reading of students. 9:20-10:40. 3 s.h.

Sublett

237. Literature for Adolescents. This course offers a critical survey of literature written for, or appropriate for, junior and senior high-school students. Fiction, non-fiction, biography, poetry, and drama are examined. Both adult and transition-type literature are considered. Methods of organizing the program in literature are explored. 7:40-9:00. 3 s.h.

Hipps

239. Methods and Problems of Teaching English in Secondary Schools. This course will present sound methods of teaching the reading of literature and other forms of writing, language, grammar and composition. Materials will include selections found in widely adopted textbooks, numerous specimen themes for grading, and current books and articles in the field. Several short compositions and a report will be required. 9:20-10:40. 3 s.h. Hipps

243. Personality Dynamics. A study of personality structure and dynamics with emphasis upon the implications for counseling and instruction. Prerequisite: 6 hours of psychology or educational psychology.

7:40-9:00. 3 s.h. S. Gehman

246. The Teaching of Mathematics. This course deals with such topics as aims, curriculum, course and lesson planning, and classroom procedure for teaching secondary-school mathematics. (June 12-June 29.) 11:00-12:20, Monday through Saturday and 2:00-3:20, Monday through Friday.

Reynolds 3 s.h.

250, 251. Teaching Emotionally Disturbed Children: Internship. Basic principles and practices in teaching and the organization of instructional materials. Work with children under the supervision of a certified teacher of emotionally disturbed children. Experience in general classroom teaching and small group and individualized instruction. Participation in staff conferences involving psychiatrists, phychologists, social case workers, and professional educators. To be arranged. 3 s.h. each. S. Gehman

- 253. School Law. The primary purpose of this course is to familiarize school administrators and teachers with the legal features of school organization and administration. Although some attention is given to constitutional and statutory provisions, the main emphasis is upon court decisions relating to education. Students are expected to select appropriate problems in school law for intensive study. 7:40-9:00. 3 s.h. Bolmeier
- 276. The Teaching of High-School Science. Discussion, lectures and collateral reading, related to such topics as aims, tests, curriculum, classroom and laboratory procedure, field trips, course and lesson planning for secondary-school science. 2:00-4:00 daily, Monday through Friday. 3 s.h. Githens
- 315. Seminar in Secondary-School Teaching. Advanced level consideration of principles, practices, and problems in secondary-school instruction. Designed particularly to accompany an internship. For students without previous internship credit, this course must be accompanied by Education 216.

315.1 7:40-9:00. 3 s.h. Nelson 315.2 7:40-9:00. 3 s.h. Hurlburt

Second Term

203. Principles of School Administration. The fundamental facts and procedures of school administration, an analysis of the problems and policies of the organization and direction of a local school system, and the functions of the various school officials. 9:20-10:40. 3 s.h.

223. Teaching the Language Arts. Comparison of current methods and materials in the teaching of handwriting, spelling, and oral and written composition. Analysis and correction of basic difficulties. Increasing opportunities for creative expression. Correlation of language arts with other activities and school subjects. 9:20-10:40. 3 s.h.

225. The Teaching of History and the Social Studies. Evaluation of the objectives, content, materials, and methods in the teaching of history and

the social studies. 9:20-10:40. 3 s.h. Cartwright

226. Teaching Reading in the Elementary School. A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. 7:40-9:00. 3 s.h.

228. Improvement of Instruction in the Social Studies. An advanced treatment of curriculum, methods, and materials in the social studies. Individuals will concentrate on subjects and grade levels of their choice.

11:00-12:20. 3 s.h. Cartwright

234. Secondary-School Organization and Administration. This course is designed especially for principals, teachers, and other prospective members of the secondary-school staff. The scope of secondary education is considered to encompass junior high school, regular high school, senior high, and junior college. Special treatment is given to the problems of internal organization and management. 7:40-9:00. 3 s.h. Bolmeier

258. Educational Measurements. A critical study of the principles and techniques involved in measurement in education, with opportunity for individual research. Prerequisite: twelve semester hours in the Department, including a course in educational psychology. 11:00-12:20. 3 s.h. Simono

291. Public and Community Relations of Schools. A study of the relationships between the entire school or school system and the several publics, especially to the community of a given school. Media for interpreting needs and views of the school to the public and vice-versa will be explored. The study applies to both public and private schools. 11:00-12:20. 3 s.h. Stumpf

Engineering

Professor J. L. Meriam, Dean of the School of Engineering (136 Engineering Building, West Campus); Professor Charles R. Vail, Associate Dean of Graduate Study and Research (136 Engineering Building, West Campus); Associate Professor E. K. Kraybill, Associate Dean of Undergraduate Study (136 Engineering Building, West Campus)

First Term

C.E. 365. *Advanced Topics in Civil Engineering. Opportunity for study of advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 s.h. Graduate Staff

C.E. 399. "Special Readings in Civil Engineering. Special individual readings in a specific area of study in Civil Engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h. Graduate Staff

E.E. 265. *Advanced Topics in Electrical Engineering. Opportunity for study of advanced subjects related to programs within the Electrical Engineering Department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. Graduate Staff

E.E. 399. *Special Readings in Electrical Engineering. Special individual readings in a specified area of study in electrical engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h.

Graduate Staff

M.E. 265. Advanced Topics in Mechanical Engineering. Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisite:

Offered only upon sufficient demand; enrollment limited.

approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. Graduate Staff

Second Term

C.E. 365. *Advanced Topics in Civil Engineering. Opportunity for advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 s.h. Graduate Staff

C.E. 399. "Special Readings in Civil Engineering. Special individual readings in a specific area of study in Civil Engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h. Graduate Staff

E.E. 265. *Advanced Topics in Electrical Engineering. Opportunity for study of advanced subjects related to programs within the Electrical Engineering Department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. Graduate Staff

E.E. 399. *Special Readings in Electrical Engineering. Special individual readings in a specified area of study in electrical engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h.

Graduate Staff

M.E. 265. Advanced Topics in Mechanical Engineering. Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. Graduate Staff

English

Professor Lionel Stevenson, Chairman (323 Allen Building, West Campus); Professor Benjamin Boyce, Acting Director of Graduate Studies (321 Allen Building, West Campus); Associate Professor Oliver Ferguson, Director of Undergraduate Studies (322 Allen Building, West Campus)

Candidates for the Master's degree in English are expected to have had at least eighteen semester hours in undergraduate courses above the sophomore level. The Department may also require additional courses if the work of the student in his first term indicates inadequate preparation.

First Term

55. Representative British Writers. Chaucer's Prologue to The Canterbury Tales, and at least two tales, Shakespeare's I Henry IV, Hamlet, or King Lear, and one other play, John Donne's poetry (selections), and Mil-

ton's Paradise Lost (selections) and some of the shorter poems. 7:40-

9:00. 3 s.h. Jennings

57. Representative American Writers. Selections and complete works of Poe, Emerson or Thoreau, Hawthorne, Melville, Whitman, Emily Dickinson, and Mark Twain. 9:20-10:40. 3 s.h. Strandberg

220. Late Eighteenth-Century Literature. Writers studied include Gray, Johnson, Boswell, Collins, Goldsmith, the novelists, and others.

9:20-10:40. 3 s.h. Ferguson

- 221. English Literature of the Early Nineteenth Century. The British Romantic poets and prose writers from Scott to the early Carlyle, with special attention to Wordsworth, Coleridge, and Keats. 7:40-9:00. 3 s.h. Stevenson
- 224. English Literature of the Later Nineteenth Century. Some of the most important works of the period are discussed, with special attention to Arnold, Ruskin, Pater, George Eliot, Meredith, the Pre-Raphaelites, and Swinburne. 9:20-10:40. 3 s.h. Stevenson

236. American Literature Since 1920. Poetry from the Imagist move-

ment to the present. 11:00-12:20. 3 s.h. Strandberg

346. Studies in Swift. Intensive study of the major prose; selected readings in the verse, political writings, and miscellaneous prose. 11:00-12:20. 3 s.h. Ferguson

Second Term

56. Representative British Writers. Novels by Fielding (Joseph Andrews), Dickens (Great Expectations), and Hardy (The Mayor of Casterbridge), and selections from the poetry of Pope, Wordsworth, Keats, and Yeats. 7:40-9:00. 3 s.h. *lackson*

58. Representative American Writers. Selections and complete works of James, Frost or Robinson, Dreiser, O'Neill, Cummings, and Faulkner or

Hemingway. 9:20-10:40. 3 s.h. Byrd

203. Chaucer. Reading and interpretation of the minor poems, Troilus,

and The Canterbury Tales. 7:40-9:00. 3 s.h. Reiss

209. Present-Day English. A description of present-day American English from the point of view of modern linguistic theory; comparison of traditional and structural grammars; semantic change; the relation of the written to the spoken language; usage. 11:00-12:20. 3 s.h.

229. American Literature, 1800-1865. The writers emphasized are

Emerson, Thoreau, and Hawthorne. 9:20-10:40. 3 s.h. Budd

261. English Literature of the Twentieth Century. Representative work of Shaw, Conrad, Yeats, Wells, Bennett, Galsworthy, Ford, Synge,

Forster, and Lawrence. 9:20-10:40. 3 s.h. Smith

363. Studies in British Poetry of the Twentieth Century. Detailed examination of major poetic texts, with background readings in prose. 11:00-12:20. 3 s.h. Smith

Forestry

Professor E. S. Harrar, Dean of the School of Forestry (213 Biological Sciences Building, West Campus); Professor J. G. Yoho, Director of Graduate Studies (104 Biological Sciences Building, West Campus)

Qualified students may engage in thesis research in certain branches of forestry during the Summer Session with the approval of the instructor concerned and the Dean of the School of Forestry, or of the Director of Graduate Studies in the case of work taken through the Graduate School.

357. Research in Forestry. Open to students whose research programs for the M.F. or D.F. degree have been approved by the Dean of the School of Forestry and the instructor responsible for directing the research and whose programs for the A.M. or Ph.D. degree have been approved by the Director of Graduate Studies and the instructor in charge. (Credits and schedule to be arranged.) June 12-August 25. 2 to 12 s.h. (Not more than one semester hour of credit per week for full-time schedule or one semester hour each two weeks for half-time schedule.) (Consult courses 301-302 in Announcement of School of Forestry for letter designation of branches of forestry in which research is to be conducted.) Staff

Geology

Associate Professor S. Duncan Heron, Jr., Acting Chairman and Director of Graduate Studies (105 Science Building, East Campus); Associate Professor William J. Furbish, Director of Undergraduate Studies (101 Science Building, East Campus)

The class in Geology 51, Term I, will begin on June 19 and continue through July 18. The class in Geology 52, Term II, will begin on July 21 and continue through August 17. Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see *General Registration* on page 31 of this *Bulletin*. (Geology classes will not meet on Saturdays.)

First Term

51. General Geology. This course is designed to give a general view of the surface features of the earth, their origin, structure, and materials. Illustrative materials are studied in the laboratory. Excursions may be made to neighboring points where principles of the science are studied in the field. Lectures or recitations, 8:00-10:30 daily; laboratory, 1:00-4:00. Monday through Thursday. June 19-July 18. 4 s.h. Heron

205 (Beaufort). Geological Oceanography. The study of the broad geologic aspects of the ocean basins, including origin, bottom physiography, sediment distribution and sedimentary processes. Observations in the field will be emphasized and will include training in sampling procedures for both shallow and deep water. (This course is not open to students who have completed Geology 206.) 6 s.h. *Pilkey*

Second Term

52. General Geology. This course is designed to give some knowledge of the chief events of the earth's history. Excursions may be made to suitable neighboring localities. Lectures or recitations, 8:00-10:30 daily; laboratory, 1:00-4:00. Monday through Thursday. July 21-August 17. 4 s.h. Lynts

German

Professor Herman Salinger, Chairman and Director of Graduate Studies (106 Language Building, West Campus); Associate Professor Richard K. Seymour, Director of Undergraduate Studies (102 Language Building, West Campus)

The work in German 1, 2, 63, and 64 will be coordinated with listening and oral practice in the language laboratory which students in German classes will be privileged to attend.

First Term

1. Elementary German. Practice in understanding, speaking, reading, and writing. Classroom techniques are combined with those of the language laboratory. 11:00-12:20; and on Tuesdays and Fridays, 2:00-3:20. Staff 4 s.h.

63. Intermediate German. Grammar review and composition; reading of short stories, novels, and poems. Prerequisite: German 1-2, or two units

of high-school German. 9:20-10:40. 3 s.h.

64. Intermediate German. Continuation of German 63. Prerequisite: German 63 which may be taken concurrently. 11:00-12:20. 3 s.h. Seymour

Graduate Reading Course. An intensive course in German to develop rapidly the ability to read technical German in several fields. For grad-

uate students only. 9:20-10:40. No degree credit. Seymour

191. Independent Study. Directed reading and research. Open only to qualified students in the junior year, by permission of the Department. Salinger

193. Independent Study. Directed reading and research. Open only to

qualified students in the senior year, by permission of the Department. 3 s.h. Salinger

Second Term

2. Elementary German. Practice in understanding, speaking, reading, and writing. Classroom techniques are combined with those of the language laboratory. Prerequisite: German 1 or equivalent. 11:00-12:20; and on Tuesdays and Fridays, 2:00-3:20. 4 s.h. Staff

Health and Physical Education

Edmund M. Cameron, *Director*, *Trinity College and College of Engineering* (109 Indoor Stadium, West Campus); Professor J. A. Friedrich, *Chairman*, *Health and Physical Education* (107 Card Gymnasium, West Campus)

First Term

PE 182. The Administration of Health and Physical Education in Secondary Schools. Presents the everyday problems that arise in the experience of the teacher of health and physical education. Open to juniors and seniors. 11:00-12:20. 3 s.h. Davis

PE 190. Protective Practices in Physical Education. Training and conditioning of athletic teams and the prevention, diagnosis, and treatment of athletic injuries. Gymnasium. 7:40-9:00. 3 s.h. Davis

History

Professor Joel Colton, Chairman (235 Allen Building, West Campus); Professor Robert F. Durden, Director of Graduate Studies (236 Allen Building, West Campus); Associate Professor Charles R. Young, Director of Undergraduate Studies (102 West Duke Building, East Campus)

For admission to candidacy for a Master's degree in History, the student must present a total of twelve semester hours of prior work in History, of which at least six must be in American History if he plans to take his major work in that field. Candidates for the degrees of Master of Arts and Master of Arts in Teaching are required to complete at least three hours of seminar work and are strongly urged to enroll for this work in the second term of their attendance in the Summer Session. (See courses numbered 300 or above.)

First Term

51. A History of European Civilization. Major problems in the development and world impact of European civilization to about 1815, critical evaluation of historical interpretations, and investigation of history from

primary sources. 7:40-9:00. 3 s.h. Krantz

91. The Development of American Democracy to 1865. This course is a study of trends vital to an understanding of the United States today. The main theme is the development of American democracy. Problems of foreign policy, the growth of capitalism, political practices, social reform, and conflicting ideals are considered in relation to this main theme. 7:40-9:00. 3 s.h. Noggle

103. Renaissance Europe. The age of the Renaissance with special attention to intellectual, religious, and social movements. 9:20-10:40. 3

Krantz.

206, The United States in the Twentieth Century: Since World War I. 9:20-10:40. 3 s.h. Noggle

251. Recent European History. Political, economic, and intellectual developments in Western Europe since 1870. 11:00-12:20. 3 s.h. Colton

- 255. The Emergence of the New South. The course deals with such subjects as the impact of industrialization and immigration; the agrarian revolt of the 1890's; the changing status of the Negro; the South's role in two World Wars and in the reform movements headed by Theodore Roosevelt, Woodrow Wilson and Franklin D. Roosevelt. 7:40-9:00. 3 Durden
- 301. Seminar in Historical Investigation. A course designed to introduce teachers, current and prospective, to the processes of historical research through investigation of particular instances. The topics selected for investigation vary with the needs and interests of each individual. 1:40-3:00 or at an hour to be arranged. 3 s.h. Colton

Second Term

52. A History of European Civilization. A continuation of History 51.

1815 to the present. 7:40-9:00. 3 s.h. Lerner

92. The Development of American Democracy, 1865 to the Present. The emphasis is on the emergence of contemporary problems. 7:40-9:00. Twyman 3 s.h.

162. History of Russia, 1917 to the Present. The history and policies of the Soviet state since the Revolution of 1917. 9:20-10:40. 3 s.h.

203. The United States, 1850-1877. The Civil War and Reconstruction.

11:00-12:20. 3 s.h. Twyman

229. Recent Interpretations of Modern European History. A course designed to develop the ability to appraise critical historical issues through the study and discussion of recent interpretations of key historical problems in modern European history. 7:40-9:00. 3 s.h.

302. Seminar in Historical Investigation. See description of 301. 1:40-3:00 or at an hour to be arranged. 3 s.h. Ropp

Hospital Administration

Professor Ray E. Brown, *Director of the Graduate Program in Hospital Administration* (234B Baker House); Assistant Professor Donald S. Smith, II, *Coordinator of Graduate Studies* (234B Baker House).

Second Term

201. History and Development of Hospitals and Other Health Agencies. This course is designed to give the student a broad concept of the health field. It includes a study of the evolution of health institutions; analysis of medical care organizations in the United States; the emergence of the health professions. Permission of the instructor required. 3 s.h. Smith

Mathematics

Professor John H. Roberts, *Chairman* (135 Physics Building, West Campus); Professor Seth L. Warner, *Director of Graduate Studies* (135 Physics Building, West Campus); Professor Francis G. Dressel, *Director of Undergraduate Studies* (135 Physics Building, West Campus)

Graduate students are invited to consult with the Director of Graduate Studies concerning their programs.

First Term

21. Introductory Calculus. Rectangular coordinates, functions, graphs, derivatives, maxima and minima, indefinite integrals, areas. Prerequisite: two and one-half units of college preparatory mathematics. 9:20-10:40. 3 s.h. Hinrichs

231. Elementary Differential Equations. Solution of differential equations of elementary types; formation and integration of equations arising in applications. Not open to students who have had Mathematics 111. Prerequisite: Mathematics 63. 11:00-12:20. 3 s.h. Kitchen

259. Solid Analytic Geometry. Spatial and n-dimensional coordinate geometry. Configurations of planes and lines, quadric surfaces, algebraic curves. Prerequisite: Mathematics 64. 7:40-9:00. 3 s.h. Roberts

Second Term

22. Introductory Calculus. Application of the definite integral to distance, volume, length, area of surface of revolution moments, centroids, integration. Prerequisite: Mathematics 21. 9:20-10:40. 3 s.h. Baxley

217. Analysis. Introduction to set theory, construction of real and complex numbers beginning with the Peano postulates, elementary topology of real and complex numbers, properties of continuous functions, derivatives, mean value theorem, Riemann integral, fundamental theorem of integral calculus. Prerequisite: Mathematics 64. 11:00-12:20.

271. Introductory Topology. Basic set theory; topological spaces; separation axioms, metric spaces; continuity; connectedness; paracompactness. Prerequisite: Calculus. 7:40-9:00. 3 s.h.

Mathematics and Science Institute

Only persons who are regular participants in the Summer Science and Mathematics Institute are eligible for these courses, except by special permission from the Director of the Institute.

Botany 213. Survey of Modern Botany I. 3 units (graduate).

Zoology 205. Zoology for Teachers. 3 units (graduate).

Botany 235-236. Field Botany. 6 units (graduate).

Zoology 225-226. Field Zoology. 6 units (graduate).

Mathematics 21, 22, 63. Introductory and Intermediate Calculus. 9 units (undergraduate).

Mathematics 209. Geometry for Teachers. 3 units (graduate).

Mathematics 211, Finite Mathematics. 3 units (graduate).

Mathematics 216. Intermediate Analysis. 3 units (graduate).

Chemistry 1. Inorganic Chemistry with Mathematics Refresher. (noncredit).

Chemistry 214. Advanced Chemistry for Teachers. 4 units (graduate).

Chemistry 253. Intermediate Organic Chemistry. 3 units (graduate).

Chemistry 265. Inorganic Chemistry. 3 units (graduate).

Physics 161. Modern Physics. 3 units (*).

Physics 231, 232. Physics for Teachers. 6 units (graduate).

Mycology

325. Medical Mycology. A lecture and laboratory course with emphasis on those fungi which cause disease in man and animals. The course includes practical laboratory work with materials from patients in Duke Hospital and those sent to the Duke Fungus Registry from outside sources. June 26-July 22, 1967. Lecture daily (Monday-Saturday), 8:00-9:00 a.m.; laboratory (Monday-Friday), 9:00-12:00 and 1:30-4:30 p.m.; Saturday 9:00-12:00. 4 s.h.

^{*} Six units of 100-level work may be counted toward the M.A.T. degree.

Courses open only to students in the School of Nursing.

N50. Chemistry. A course in the fundamentals of general inorganic chemistry with particular emphasis on introduction to organic chemistry.

3 s.h. Thiers and Bernheim

N180. Public Health Science. A body of knowledge derived from the field of public health which includes an introduction to public health administration, environmental sanitation, bio-statistics and epidemiology. 3 s.h. Prerequisite to N181.

N269. Thesis Research. Development of a research in nursing under

direction of the faculty. (3 units).

N311. Seminar in Selected Problems. (2 units).

Philosophy

Professor Charles A. Baylis, Chairman (212D West Duke Building, East Campus); Professor Paul Welsh, Director of Graduate Studies (212C West Duke Building, East Campus); Associate Professor N. L. Wilson, Director of Undergraduate Studies (212A West Duke Building, East Campus)

First Term

- 41. Knowledge, Fact, and Value. An introduction to philosophy through the study of some of its main problems. These include, the nature of truth and fact, of evidence, faith and knowledge, and of the fundamental categories descriptive of the universe. 9:20-10:40. 3 s.h. Peach
- 94. History of Philosophy: Ancient and Modern. An introduction to philosophy through the study of some of the major writings of the modern philosophers through Kant. (Open to freshmen with a B average.) 11:00-12:20. 3 s.h. Peach

Second Term

- 42. Knowledge, Fact, and Value. An introduction to philosophy through the study of some of its main problems. These include the nature and ground of values, ultimate goals, and moral obligation. 9:20-10:40. 3 s.h. Tice
- 93. History of Philosophy: Ancient and Modern. An introduction to philosophy through the study of some of the major writings of the ancient Greek philosophers and modern philosophers through Kant. (Open to freshmen with a B average.) 11:00-12:20. 3 s.h. Tice

Physics

Professor Henry A. Fairbank, Chairman (118 Physics Building, West Campus); Professor Eugene Greuling, Director of Graduate Studies (211B Physics Building, West Campus); Professor Horst Meyer, Director of Undergraduate Studies (0028 Physics Building, West Campus)

Classes in Physics 41, Term I, will begin on June 19 and continue through July 18. Classes in Physics 42, Term II, will begin on July 21 and continue through August 17. Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see General Registration on page 31 of this Bulletin. (Physics classes will not meet on Saturdays.)

First Term

41. General Physics. This course treats the basic principles of general physics in a more quantitative manner than Physics 1-2. It meets in a thorough way the physics requirement for entrance into the study of either medicine or engineering, and is well suited for the general science student. This course is not open for credit for students who have completed Physics 1-2. Lecture and recitation daily, 8:30-9:50 and 10:10-11:30; laboratory four days per week, 1:00-4:00. Prerequisites: Mathematics 21, 22 or equivalent. 4 s.h. Carpenter and Staff

353X. Thesis Seminar. Students who are properly qualified may carry on research work under direction. Credits and hours to be arranged.

Staff

Second Term

42. General Physics. A continuation of Physics 41. Prerequisite: Physics 41. Lecture and recitation daily, 8:30-9:50 and 10:10-11:30; laboratory four days per week, 1:00-4:00. 4 s.h. Carpenter and Staff

Political Science

Professor John H. Hallowell, Chairman (307 Library, West Campus); Professor J. Harris Proctor, Director of Graduate Studies (103 Carr, East Campus and 303 Library, West Campus); Professor Richard L. Leach, Director of Undergraduate Studies (315 Library, West Campus)

First Term

61. The American Political System. An analysis of the principles and institutions of government and politics in the United States. 11:00-12:20. 3 s.h. Leach

231. American Political Theory. An analysis of the main currents in American political thought from colonial beginnings to the present day, with emphasis upon the development of liberalism in America. 9:20-10:40. 3 s.h. Leach

Second Term

62. Comparative Political Systems. An analysis of the principles and institutions of selected foreign governments, as compared with those of

the United States. 11:00-12:20. 3 s.h. Willhoite

229. Recent and Contemporary Political Theory. The rise of positivism and its impact upon modern political thought, the origins of socialism, Marxism and its variants, socialism in the Soviet Union, nationalism, Fascism and National Socialism, the crisis in modern democracy, Christianity and the social order. 7:40-9:00. 3 s.h. Willhoite

Psychology

Professor Edward E. Jones, Acting Chairman (225 Building 9, West Campus); Professor Norman Guttman, Director of Graduate Studies (231 Building 9, West Campus); Professor Jack W. Brehm, Director of Undergraduate Studies (223 Building 9, West Campus)

Details concerning the program in studies in Psychology may be obtained from the Director of Graduate Studies in Psychology.

First Term

91. Introductory Psychology. An introduction to the facts, principles, and problems of psychology through a study of motivation, emotions, perception, sensation, thinking, memory, learning, social behavior, individual differences, and personality. 7:40-9:00. 3 s.h. Erickson

141. Personality and Behavior Disorder. Behavior disorder studied from the viewpoint of the psychological principles underlying the adjustment of the deviant personality. Prerequisite: Psychology 100. 9:20-

10:40. 3 s.h. Feather

- 211. The Problem Child (Also Education 211). Study of problem behavior and adjustment in children with emphasis on the causes and treatment of conduct and neurotic disorders of the maladjusted child. Particular attention will be paid to mental hygiene principles in the handling of problem children in school and home. 9:20-10:40. 3 s.h. Gehman
- 232. Personality and Physical Handicap. Survey of the psychological factors underlying adjustment to physical disabilities, with particular stress upon personality, emotional and social attributes. Selected case studies will be used to illustrate the integration of such factors in adjusting

to home, school, and hospital settings. These cases will stress the psychological factors which hinder learning and retraining procedures. Discussion will center about psychological techniques to produce more effective progress in rehabilitation. 7:40-9:00. 3 s.h. Huse

303. Research. Students who are properly qualified may carry on research work under direction. Hours and credits to be arranged. Staff

Second Term

100. Personality. Representative theories of personality, from Freud to the present, emphasizing problems of normal personality structure, dynamics, development, and assessment. 9:20-10:40. 3 s.h. Carson

304. Research. Students who are properly qualified may carry on research work under direction. Hours and credits to be arranged. Staff

Religion

Associate Professor Thomas A. Langford, Chairman (118 Divinity School, West Campus); Professor Stuart C. Henry, Acting Director of Graduate Studies (326 Divinity School, West Campus); Associate Professor J. H. Phillips, Director of Undergraduate Studies (117 Divinity School, West Campus)

First Term

51. The English Bible. A survey of the Old Testament, similar to Religion 1 but adapted to the capabilities of sophomores, juniors, and seniors. Not open to freshmen, or to students who have received credit for Religion 1. 7:40-9:00. 3 s.h. McCollough

55. The Religion of the Bible. An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen, or to students who have received credit for Religion 1-2 or 51-52. 9:20-10:40. 3 s.h. Sullivan

152. Christian Ethics. A systematic study of the ethical implications of Biblical religion. Attention is given both to the historical development of the Christian ethic and to the responsibility of the Christian in the various aspects of contemporary social life, such as marriage, the state, race, etc. Not open to students who have received credit for Religion 85. 9:20-10:40. 3 s.h. McCollough

175. Non-Christian Religions of the Modern World. An examination of the beliefs of Islam and the religions of India, China, and Japan. Emphasis will be placed upon the sacred literature, world view, history,

and cultural and social significance of the principal non-Christian religions. Not open to students who have received credit for Religion 93. 11:00-12:20. 3 s.h. Sullivan

Second Term

52. The English Bible. A survey of the New Testament, similar to Religion 2 but adapted to the capabilities of sophomores, juniors, and seniors. Not open to freshmen, or to students who have received credit for Religion

2. 7:40-9:00. 3 s.h. Langford

93. Survey of the World's Living Religions. An introductory course designed to acquaint the student with the problems and methods of the study of world religions. After a brief consideration of religion in primitive culture, the world's living religions are dealt with in terms of historical development and beliefs, practices, and contemporary importance of each. Prerequisite: Religion 55 or equivalent. 9:20-10:40. 3 s.h. Partin

144. Problems of Religious Thought. A study of the relation of belief in God to various other types of knowledge and experience, such as the research of natural and social scientists and the fact of suffering, human

tragedy, and evil. 11:00-12:20. 3 s.h. Langford

178. Myth and Symbol. Historical and phenomenological study of religious myth and symbol, Christian and non-Christian. The nature and function of myth in religion; types of myths, with particular attention to cosmogonic myths. The nature of religious symbols; structural and comparative study of selected symbols. 7:40-9:00.3 s.h. Partin

Romance Languages

Professor John Fein, *Chairman* (205 Building 5, West Campus); Associate Professor Thomas H. Cordle, *Director of Graduate Studies* (303 Building 5, West Campus)

French

First Term

1. Elementary French. Introduction to understanding, speaking, and writing French. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. Bryan

63. Intermediate French. Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Pre-

requisite: French 1-2 or two years of high-school French. 9:20-10:40 and Mondays and Thursdays 2:00-3:20. 4 s.h. Tate

Second Term

2. Elementary French. Continuation of 1. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. O'Keefe

64. Intermediate French. Continuation of 63. 9:20-10:40 and Mondays and Thursdays 2:00-3:20. 4 s.h. Beron

Spanish

First Term

1. Elementary Spanish. Introduction to understanding, speaking, and writing Spanish. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. Cox

63. Intermediate Spanish. Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: Spanish 1-2 or two years of high-school Spanish. 7:40-9:00 and

Mondays and Thursdays 2:00-3:20. 4 s.h. Torre

Second Term

2. Elementary Spanish. Continuation of 1. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. Glenn

64. Intermediate Spanish. Continuation of 63. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. Miller

Russian

Associate Professor Magnus J. Krynski, Chairman (314 Languages Building, West Campus)

First Term

1. Elementary Russian. Introduction to understanding, speaking, reading and writing. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 9:20-10:40 and language laboratory in the afternoon. 4 s.h. Jezierski

Second Term

2. Elementary Russian. Continuation of 1. 9:20-10:40 and language laboratory in the afternoon. 4 s.h. Hankin

Sociology and Anthropology

Professor John C. McKinney, Chairman (268I Building 9, West Campus); Professor Alan C. Kerckhoff, Director of Graduate Studies (271 Building 9, West Campus); Assistant Professor W. Reynolds Farley, Director of Undergraduate Studies (250 Building 9, West Campus)

The Department of Sociology offers graduate work leading to the A.M. and Ph.D. degrees. Before undertaking advanced work in this Department, a student must have completed a minimum of 12 semester hours of approved preliminary courses in the field, and 12 additional semester hours in the field or in related work. A student who is deficient in the minimum required work will be asked to take additional undergraduate courses agreed upon in conference with the Director of Graduate Studies.

Candidates for advanced degrees in Sociology usually take minor work in Psychology, Economics, Political Science, Education, History, or Religion. Detailed requirements for the minor work, and for majors in other departments who wish to present Sociology as minor work, may be obtained from the Director of Graduate Studies.

First Term

- 91. Introduction to Sociology: Concepts and Procedures. Concepts and procedures of sociology and illustrations of their use in understanding specific areas of social life. Open to freshmen. 11:00-12:20. 3 s.h. Bean
- 154. The Sociology of the Arts. An analysis of the social relations of the world of the arts (painting and sculpture, music, and literature) with emphasis upon creative artists, art publics, art organizations and art works as they function in their social-cultural milieux. 9:20-10:40. 3 s.h. Wilson
- 242. The Sociology of Occupations and Professions. The social significance of work. Analysis of forces changing the contemporary occupational structure, typical career patterns of professions and occupations, the social organization of occupational groups. 11:00-12:20. 3 s.h. Wilson

Second Term

- 92. Introduction to Sociology: Sociological Studies. Application of theories and methods of sociology through an examination of several empirical studies dealing with various aspects of social behavior. 11:00-12:20. 3 s.h. Darroch
- **255.** Race and Culture. A comparative study of race relations in world perspective developed around such themes as races and personal identity,

the geography and ecology of race relations, the idea of race, and race conflict. 11:00-12:20. 3 s.h. Himes

272. The Socialization Process. Universial societal requirement for continual replacement of socialized personnel. Variations in socialization by position in the social structure (class, caste, urban-rural, etc.) and contributions made by various socialization agencies (family, school, peer groups, mass media). Western society is the focus of study. 9:20-10:40. 3 s.h. Himes

Zoology

Professor Edward C. Horn, Chairman (227 Biological Sciences Building, West Campus); Associate Professor R. Bruce Nicklas, Director of Graduate Studies (044 Biological Sciences Building, West Campus); Professor Joseph R. Bailey, Director of Undergraduate Studies (340 Biological Sciences Building, West Campus)

All classes in Zoology are offered at the Duke University Marine Laboratory at Beaufort, North Carolina (Term I, June 12-July 18; Term II, July 20-August 25). Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see General Registration page 31 of this Bulletin. For detailed instructions and further information on these offerings see the Bulletin of Duke University Marine Laboratory.

To undertake study toward an advanced degree in Zoology, a student should have completed an undergraduate major in Zoology or its equivalent. This normally amounts to twenty-four or more hours of course work distributed among various fields of Zoology. The Department recognizes the trend in modern biology towards interdisciplinary research, and part of the Zoology requirements may be replaced by advanced work in

Chemistry, Mathematics, Physics, etc.

Required work for the A.M. degree ordinarily includes twelve units of advanced course work in Zoology, six units of course work in a minor department, and an additional six units of advanced course work in the major or minor department, or in other pertinent departments. Furthermore, an acceptable thesis is necessary for the fulfillment of the degree

requirements.

Candidates for the Ph.D. degree are expected to be broadly trained zoologists. The program of each candidate is determined by a committee which reviews previous training and sets the specific requirements to be made. Normally the program includes graduate courses in several fields of Zoology, courses in the minor subject, wide reading in science in general and in biology in particular, research, and dissertation based on original work. Minor work is available in many fields, including Anatomy, Biochemistry, Botany, Chemistry, Physics, Physiology and Psychology.

First Term (Duke Campus)

353. Research. Hours to be arranged. 2-6 s.h. Staff

First Term (Duke Marine Laboratory)

203 (Beaufort). Marine Ecology. A study of marine animals in relation to environment. Consideration of environmental factors, succession, rhythms, communities, intraspecific and interspecific relations, productivity, conservation problems, etc., concerned with animal life in the ocean. Lectures, reviews, conferences, field and laboratory work. 6 s.h. Gray

250 (Beaufort). Physiological Ecology of Marine Animals. A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla and from various habitats are studied. Prerequisite: Zoology 151 or equivalent. 6 s.h. Vernberg

353. Research. Hours to be arranged. 2-6 s.h. Staff

Second Term (Duke Campus)

354. Research. Hours to be arranged. 2-6 s.h. Staff

Second Term (Duke Marine Laboratory)

of the ocean floor; physical and chemical Oceanography. Relief of the ocean floor; physical and chemical properties of sea water; distribution of temperature, salinity, and density; heat budget; sea ice; light; ocean currents, waves and tides; selected topics of regional oceanography. Field work, processing and analyzing of routine oceanographical data, solving problems and interpretation of results. Prerequisites: One year of Physics and Chemistry, Mathematics through Calculus. 6 s.h. Stefansson

274 (Beaufort). Marine Invertebrate Zoology. A study of invertebrate animals that occur in the Beaufort region. A number of field trips will be made to a variety of habitats to study, collect, and classify animals in their natural environment. The structure and habits of living invertebrates, as well as their behavior under certain experimental conditions, will be studied in the laboratory. 6 s.h. Barnes

354. Research. Hours to be arranged. 2-6 s.h. Staff

DUKE UNIVERSITY SUMMER SESSION RESIDENCE HALL APPLICATION INFORMATION TO ACCOMPANY

Application for room and apartment reservations and all correspondence concerning reservations should be addressed as appropriate to: Director of Housing, House D, Room 101-R, Duke Station, Durham, North Carolina, or Business Manager, Duke University Marine Laboratory, Beaufort, North Carolina.

Room rent is payable in advance. No deductions from grants, scholarships, etc., can be made to pay residence hall

Room assignment will be made only upon the applicant's admission to the Summer Session, as certified by the Summer Session Office, and upon payment of full room rent. Applicants who expect to be in residence for longer than one term of the Summer Session are urged to make advance reservation for the entire period and thus avoid, to the extent that housing arrangements make it practicable, the necessity of moving from one room to another during the full term of residence.

See page 28 of Summer Session Bulletin for information concerning refund of fees.

When no single rooms are available, a person requesting a single room will be assigned a double room occupied by one person and charged room rent as stated below.

indicate mutual agreement and are on hand in the Housing Bureau at the time of room assignment. If the applicant requests a double room but gives no preference of roommate, the Director of Housing will try to assign a roomroommate rests with the applicant; otherwise it will be necessary for him/her to move to a single room or to make Requests for specific roommates will be complied with, provided completed application form of both applicants mate of seemingly congenial interests. It is understood, however, that the responsibility for getting and keeping a the indicated financial adjustment.

Please Retain This Sheet See Reverse

RESIDENCE HALL ROOMS—RATES

10 weeks\$130.00 9 weeks117.00 8 weeks104.00	Double 10 weeks \$102.50 9 weeks 92.25 8 weeks 82.00	-Graduate Women Only PER WEEK- \$21.00 each student (3 to an
5 weeks	5 weeks	apartment) \$36.00 each student (2 to an apartment) (Not assigned for less than 8 weeks)
Single Dou 10 weeks \$102.50 10 10 10 10 10 10 10 10 10 10 10 10 10 1	Double \$ 87.50 10 weeks 78.75 9 weeks 70.00 5 weeks 43.75 4 weeks 35.00 1 week 8.75 person	Double rooms as singles (occupied by one person) 10 weeks\$140.00 9 weeks\$126.00 5 weeks

REFUND OF ROOM RENT

- a. When notification for room cancellation is received by the Housing Bureau on or before fifteen (15) days prior to the registration date of the Summer Session term, full room rent will be refunded.
- b. When notification for room cancellation is received between the fifteen (15) days prior to registration date and the the first four class days, 80 per cent of the room rent will be refunded.
- c. When notification for room cancellation is received after the first four days of Summer Session term, 70 per cent of the room rent for the unused period will be refunded.

Duke University Summer Session: Application For Residence Hall Room

Please Print	Male Craduate
Name.	
Mailing Address.	Permanent Address.
Present position	City
Anticipated fields of study: (1)	(2)
Name of roommates preferred: (1)	(2)
	(Town House Apartments)
Type of room desired: Single Double	Double as SingleTown House Apartments
Non-Air Conditioned Air-Conditioned	(Not Available for graduate men
Number of weeks enrolledDate of arrival at Duke	
Enclosed is check/money order payable to Duke University in amount of \$	nittance is 1
Mail completed application and check as appropriate to:	Signature
Director of Housing Duke University, Duke Station Durham, North Carolina 27706	Business Manager Duke University Marine Laboratory Beaufort, North Carolina



DIRECTIONS TO SUMMER SESSION APPLICANTS

All applicants for Summer Session courses who are not now in residence at Duke University must fill out accurately and in detail the form below and return it to the Director of the Summer Session. Preference in enrollment will be given to persons returning the form promptly, but a place in a particular course cannot be assured until all fees are paid. Undergraduates or graduates who are enrolled in a university or college other than Duke University and who are seeking to transfer summer session credits to the college in which they are matriculated should request a course approval form to be certified by their dean or registrar. Persons applying for admission to the Graduate School of Duke University should write the Dean of the Graduate School for the necessary forms in addition to completing the form below.

•							
No.	Approved	Date					
APPLICATION FOR ENROLLMENT IN THE DUKE UNIVERSITY SUMMER SESSION							
Mr., Mrs., Miss							
(Please Print) Street Address, Rural Route, or P. O. Box							
Post Office	•	State					
Please register me Bulletin.	in the following e	ourses listed in the Sum	nmer Session				
Department N	lo. of Course	Title of Course					
•							

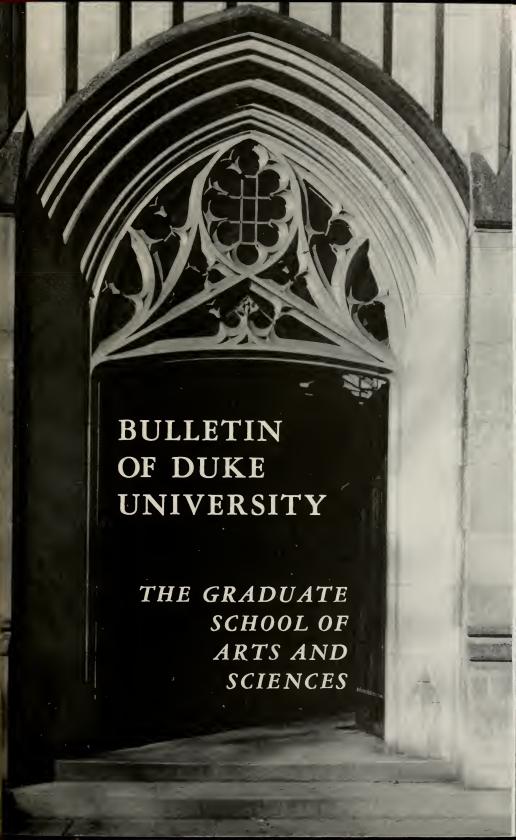
Name and address of high school from which you graduated							
Have you attended	and Sandlan	No					
•	0						
	•						
		No					
If yes, for which deg	gree?						

Check the one below which indicates your present University status. (Do not indicate a status in a Duke University School or College unless you have already been admitted to that School or College.)

Undergraduate credits	Graduate credits			
☐ Trinity College (men)	☐ Graduate School, Arts and Sciences			
☐ The Woman's College	☐ Divinity School			
☐ School of Engineering	☐ School of Forestry			
☐ Special or unclassified	☐ Special or unclassified			
☐ Credits for transfer	☐ Credits for transfer			
Are you applying for admission to the Graduate School?				
Are you at present a college student? If so, where?				
Are you a full-time teacher?				
Name and address of school	•••••			
Teaching position				
Total number years teaching experience				
Have you attended previous Summer Sessions at Duke: Yes				
Years	No			

		1907			
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Graduate Education at Duke University

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To the Prospective Graduate Student at Duke University

In 1924 a new epoch in Southern higher education began: Trinity College in Durham, North Carolina, became Duke University as a result of the munificent bequest of Mr. James B. Duke. His action has been matched in educational history only by the similar bequests to the Johns Hopkins, Chicago, and Stanford Universities in the previous fifty years. In each of these cases, a university great by both national and international standards came into being.

In keeping with Mr. Duke's desire to emphasize the advanced training of men and women for scholarship and the learned professions, the graduate and professional schools were founded. In its first year, the Graduate School of Arts and Sciences enrolled eighty-six students and granted one Master of Arts degree. In the intervening forty years, the Graduate School has awarded over 4,200 Master's and 1,500 Doctor's degrees. Today there is hardly a major university in the United States which does not have one or more Duke Ph.D.s on its faculty, and many Duke alumni occupy college and university presidencies and other educational positions of leadership.

To the student in search of a superior graduate education Duke University has much to offer: an outstanding faculty, one of the finest research libraries in the nation, a campus unusual in its spaciousness and beauty. To this student the following pages are addressed; they are meant to provide him with information to help him make one of the crucial choices of his life, that of his future career.

R. L. Predmore

Dean of the Graduate School

General Administration

Douglas Maitland Knight, Ph.D., Litt.D., LL.D., L.H.D., President R. Taylor Cole, Ph.D., Provost

Frank Leon Ashmore, A.B., Vice President for Institutional Advancement Gerhard Chester Henricksen, M.A., C.P.A., Vice President and Treasurer Everett Harold Hopkins, M.A., LL.D., Vice President for Planning and Institutional Studies, Assistant Provost

Charles B. Huestis, Vice President for Business and Finance
Frank Traver de Vyver, Ph.D., Vice Provost
Harold W. Lewis, Ph.D., Vice Provost
Richard Lionel Predmore, D.M.L., Vice Provost
Barnes Woodhall, M.D., Vice Provost
Craufurd David Goodwin, Ph.D., Assistant Provost
Robert H. Ballantyne, Ed.D., Assistant to the President for Planning
Benjamin Edward Powell, Ph.D., Librarian
Richard Lovejoy Tuthill, Ed.D., University Registrar

Rufus H. Powell, LL.B., Secretary of the University Edwin Constant Bryson, LL.B., University Counsel

Graduate School Administration

Richard Lionel Predmore, D.M.L., Dean of the Graduate School of Arts and Sciences

Francis Ezra Bowman, Ph.D., Secretary of the Graduate Faculty, Associate Dean, Acting Dean, and Director of Admissions, Graduate School of Arts and Sciences

David V. Martin, Ed.D., Assistant Dean of the Graduate School of Arts and Sciences

Executive Committee of the Graduate Faculty

Waldo Beach* Dwight Billings Francis E. Bowman Benjamin Boyce Robert Durden Norman Guttman*
Daniel A. Livingstone*
Richard L. Predmore
Charles R. Vail*
Seth L. Warner

^{*} Term ends September, 1967.

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Introduction

Writing in the 1920's, the philosopher and man of science Alfred North Whitehead described the goal of higher education in these terms: "The task of a University is the creation of the future." It is only ninety years since the founding of the first formally organized graduate school in the United States, but it has become most evident that graduate schools, through their training of teachers, researchers, industrial specialists, scientists, and government advisors, play one of the most vital roles in "the creation of the future."

Ideally, a graduate school is a community of scholars—apprentice, initiate, and master—engaged in imparting and extending the realm of man's knowledge in the arts and sciences. A select group of students is admitted each year to undergo the rigorous discipline of an advanced degree program, the successful among them to emerge as scholars of promise. To enter upon graduate education today is to accept a real challenge; but the decision should not be made lightly or casually. The work towards a doctorate involves several years of tireless effort and possible sacrifice, and the material rewards may be less certain or less bountiful than in some alternative occupation. Pursued with determination, however, graduate education may be the doorway to a stimulating, creative, and meaningful life—a life which few persons who have chosen it would exchange if they had the opportunity of reliving their student years.

The student who is contemplating this challenge usually has many questions in mind; the following pages are an attempt to answer some of them. Many of the comments are applicable to programs at any university for a variety of degrees, although emphasis is placed here on the A.M. and Ph.D. programs at Duke University.

"Should I go to graduate school?"

This frequent question can be answered only by the questioner himself. The decision to work towards an advanced degree must be a personal commitment born of a real willingness to devote oneself to many months or possibly years of hard intellectual work just at the age when one may be impatient for financial independence and freedom from academic discipline. Graduate education requires all

the energy, enthusiasm, and self-discipline at one's disposal; to enter upon it half-heartedly is to invite discouragement or failure.

An equally important requisite for success in graduate study is the possession of a keen and disciplined intellect. Of this it can only be said that "the proof of the pudding is in the eating." A good undergraduate record may or may not be adequate evidence of ability. Many a student with an excellent undergraduate record has been unsuccessful in graduate study, because his undergraduate training stressed an ability to marshal facts and to articulate these facts rather than real understanding and analysis of material. On the other hand, many distinguished scholars had undistinguished undergraduate records. It may be of some comfort to remember that Einstein had difficulty in mastering simple mathematics (although one should be certain that he is another Einstein before using this fact as an easy excuse). In gaining admission to a graduate school, one's undergraduate record is of course an important element, but usually some margin is left to allow for the student who develops a serious academic interest only at a late stage. The student himself is often better able to judge whether his grade record is a true gauge of his ability or represents an under-par performance.

If a student feels he has both the ability and a strong desire to accept the challenge, he should not let other obstacles influence unduly his decision. About two thirds of current students enrolled in Ph.D. programs in American universities have sufficient financial support from university, industry, or foundation sources to meet the minimum cost; and most universities have loan provisions to help the student without adequate resources. Today about 40 percent of graduate students are married, and a majority of students' wives work part or full time during their husbands' periods of residence. Indeed, many wives pursue an advanced program concurrently. In addition to the regular arts and sciences program, Duke has, for example, a program in secondary school teacher education, a Nursing School, a physical therapy program, and a Christian education program in the Divinity School-all of which enroll many student wives. Thus during graduate study one need not take the vows of poverty and bachelorhood which were once the prerequisite of guild apprenticeship.

There is no certain way of knowing in advance whether one will be successful or happy in graduate school; in this regard it differs little from any other career path one may choose to follow. It is quite likely, however, that if one has both the motivation and the ability and does not try it, there will be regrets in later years. Although this must be an individual choice, superior intellectual ability is a scarce human resource, and its encouragement and utilization are areas of national as well as personal concern.

"How should one choose a graduate school?"

Over two hundred and thirty universities today offer work leading to the Ph.D. degree. Among these are about sixty institutions which grant only two or three such degrees a year in all fields combined. At the other end of the scale are about forty universities which account for nearly 70 percent of all doctorates granted in this country. Duke University is among these latter, as are most of the major institutions which offer work of quality ranging across a breadth of academic disciplines. But even if one can narrow the field to about forty major institutions, how does one select among these, and what factors should affect one's final choice? A few key factors are briefly discussed below.

Size—Size is not an infallible guide to the quality of a graduate school. There are a number of poor graduate schools of exceedingly large size, and a number of extremely good small ones. There are advantages, however, in attending a university which has attained a certain level of size, although it is difficult to provide a magic number to use as a yardstick. It is simpler to mention a few of the disadvantages of too many or too few students.

An extremely large graduate school—and there are a few today which have between six and twelve thousand enrolled—is a rather far cry from the ideal of a small number of superior students working closely in intellectual pursuits with a few esteemed scholars. Classes of fifty to a hundred students, inaccessibility of senior faculty, shortage of library materials and facilities, only a nodding acquaintance with fellow students—these are only a few of the possible drawbacks. A very able student may develop well even in such an atmosphere of mass production, but this situation is hardly the ideal.

An extremely small graduate school also has its disadvantages. Most of the classes are likely to be mixed undergraduate-graduate classes, a student is not surrounded by many other good students who will help to sharpen his powers and create an atmosphere conducive to learning, facilities are often very limited, and the faculty are often primarily undergraduate instructors. A university must be willing to

commit a significant portion of its resources to develop a graduate program of high quality, and this is often not the case in an extremely small graduate school.

More important than the size of the entire graduate school is the size of the particular departmental program one is interested in. An optimum doctoral program will have an enrollment of perhaps thirty to one hundred students, admitting fifteen to forty new students each year, and turning out perhaps three to ten Ph.D.'s per year. Information on enrollment or degrees conferred is usually available in university catalogues or government publications on higher education, and a prospective student may find it useful to compare enrollments in various institutions before choosing a school.

Duke University is firmly committed to programs of moderate size where the interest of the student is paramount. Total enrollment in the graduate school is about 1,500 students; approximately four hundred new students are admitted each year from over three thousand applications. Only three departments (1966) have more than eighty students; twelve departments have enrollments that fall within the optimum range suggested in the preceding paragraph.

Quality—Not only do universities differ considerably in their reputation for quality, but there are marked differences among departments within any university. Harvard, for example, is a great university because it has many reputable departments, not because it is best in every category. On the contrary, many excellent universities have a few quite weak departments in which a student would fare less well than he might in an excellent department in a less esteemed institution. One should therefore not be guided solely by the reputation of a university as a whole, but inquire more specifically about the area in which one wishes to specialize.

Since judging the quality of a graduate program is necessarily subjective, no two people are likely to be in complete agreement. The prospective student would do well to talk with his professors in his undergraduate college, particularly those who have themselves achieved some reputation in the world of scholarship. As witnessed by their own continuing writing and research, they are more likely to have reliable information on the merits of various graduate programs. Similarly, the younger faculty member who is only four or five years out of graduate school may have more recent acquaintance with his and other schools. The relative position of a department

may change markedly over the years, so that it is of little value to know the relative ranking, for example, of the Yale Department of Economics in the 1930's when one is concerned with the merits of its graduate program in the 1960's.

Certain other measures may be of some use in choosing a graduate school of quality, although they may not be perfect reflectors. The number of Woodrow Wilson Fellows enrolled in recent years is of possible interest in this regard. These fellowships permit the superior entering student to attend the graduate school of his choice, and thus provide a rough guide to the preferences of other good students. For the years 1958–61 Duke ranked fourteenth in the country in the total number of Woodrow Wilson Fellows in attendance (fifth rank if one measures Woodrow Wilson Fellows as a percentage of total graduate enrollment). In 1966–67 eleven enrolled.

Another yardstick to quality, albeit an imperfect one, may be the occasional questionnaires asking other educators to rank various graduate departments. In one recent survey, where department chairmen in many institutions were asked to rate graduate departments in a list of thirty major universities, Duke placed a number of its departments within the first fifteen in the country. In the most recent, the American Council on Education report, nine Duke departments were placed among the first twenty.

None of these guides is adequate in itself, but taken in conjunction with individual advice and recommendations they may help the student in his selection. An extremely good student can obtain a good graduate education in a number of universities, but in such an important choice it pays to be as well informed as possible.

The best procedure is to take many factors into account in choosing where to apply for admission, and then make application at the two or three schools one would most like to attend. (Applying at fifteen universities is merely a waste of an applicant's and the universities' time.) It is wisest not to make a final selection solely on the basis of financial aid available, on the advice of a single friend or advisor, or on a university's past prestige. One should get as much current information as one can; write to the graduate school or the departmental director of graduate studies if further information is desired, visit the university in person if possible, and carefully weigh the advice of the more distinguished faculty members of one's undergraduate college.

"How long will it take?"

One of the primary questions in the mind of every student considering graduate study is "How long will it take?" This is not an easy question, however, for the answer depends partly on the requirements of the student's program, partly on the student himself, and partly on the attitude in the graduate school and the department in which he is studying.

Degree requirements are usually stated quite unambiguously. For example, at most institutions, as at Duke, a typical Master of Arts program requires one academic year of residence for the fulfillment of course requirements, the passing of a language examination, and the completion of an acceptable thesis. This normally takes a minimum period of one calendar year. The Doctor of Philosophy program requires two years of course work, plus demonstration of proficiency in two languages and satisfactory completion of a dissertation embodying the results of original research. Three years is the usual minimum time required for the Ph.D. degree.

The student's level of preparation before entering graduate school has a direct bearing on the speed with which he can progress towards a degree. One who enters with proficiency in one or more foreign languages and a good foundation in his chosen subject area may well be able to finish within the minimum time limits suggested above. On the other hand, the poorly prepared student may find that one and a half to two years are the minimum for the A.M., and four to five years for the Ph.D. (although wise use of the summers may reduce this time somewhat). The total time may also be lengthened if the student must work during part of his period of residence. (More on this subject below, under Financing Graduate Education.)

The attitude of the graduate school and its various departments will also affect the time needed to complete the degree. During the last decade the average time elapsing between entering graduate school and receiving the doctorate in American universities has been about ten years. A study of experience at Duke during the early 1950's indicated that the average doctorate in the humanities required a little over seven years, nearly six years in the social sciences, and slightly over four years in the sciences. Over the last few years, however, Duke University has been among the forerunners in reducing the time needed to obtain the Ph.D. without any sacrifice in quality. This effort has taken the form of trying to eliminate the unnecessary delays, particularly those due to financial burdens on the

student. Duke ranks among the leading institutions in the country today in terms of financial aid per student from university sources. Moreover, most of this aid is in the form of fellowships and scholarships which do not require burdensome services in return. The large public institutions are often more restricted to awards which require substantial teaching, research, or other duties, thus reducing the speed with which a student can complete his resident course work. A student will be wise to inquire to what extent his progress towards a degree may be delayed by the work entailed in certain awards. If, for example, an assistantship lengthens unduly the time necessary to obtain a degree, even a smaller fellowship may be preferable.

Another way in which Duke encourages deliberate speed towards fulfilling degree requirements is through its tuition charges. Many graduate schools charge tuition for three full years in a doctoral program. In 1958 Duke adopted the policy of charging full tuition and fees only up to the time the doctoral student passes his "pre-liminary examination." (This examination is taken upon completion of all course and language requirements, normally at the end of the second year, before the student is formally admitted to candidacy for the Ph.D.) After "prelims," tuition charges are substantially reduced. In making his choice of a graduate school, a prospective student should inquire about the fees for a full doctoral program, not merely the charges for the first year. The tuition and fee system at Duke has worked to encourage both the student and his department to arrange for preliminary examinations to be taken before the beginning of the third year. Some years ago fewer than half of the doctoral students at Duke took this examination before the beginning of the third year; today over 90 percent are doing so. This plan, aided by liberal scholarship and fellowship aid, gives the graduate student at Duke a marked advantage over his counterparts in many other graduate schools in acquiring his degree in the minimum amount of time.

How long it will take to obtain an advanced degree, therefore, depends on many factors, but the policy of the Duke Graduate School is to keep the time to the minimum consistent with continuing quality in its graduate programs.

Financing graduate education

The typical entering graduate student, after completing his fouryear undergraduate program, may not be able to continue with support from his family or from part-time earnings. All graduate schools, in order to minimize financial barriers for superior students, have at least modest funds at their disposal in the form of scholarships, fellowships, or assistantships. Some few among the private universities have sufficient funds to aid more than half of their graduate students and often make total awards which are considerably greater than their entire tuition income from such students.

In recent years at Duke about 75 per cent of all full-time students have held an award of some type; about one third of these were aided by Duke funds and the other two thirds by funds from other sources.

The student who seeks financial aid from the graduate school of his choice should be certain that he files his request for admission and award at a sufficiently early date. Applications should be complete not later than February 15th of the year in which September admission is sought. At Duke, the student's application, including transcripts of his previous college work and letters of recommendation, is processed by the Graduate School and forwarded to the department in which he wishes to pursue advanced work. The graduate faculty-or admissions committee-in the department reviews all applications and then makes its recommendation to the Dean for announcement on March 21. (In the case of graduate assistantships, these offers may be made prior to March 21.) The most outstanding applicants are then offered awards, the next in order of ranking are placed on an alternate list, and other students whom we should like to have attend but do not have sufficient funds to aid are given admission to the Graduate School. Because of multiple applications by students, a fraction of the awards offered by any graduate school are turned down by students who finally decide to go elsewhere. Alternates on the award list are immediately notified, and the process continues until the desired number of awards has been made.

The determining factors in the student's position in these rankings are the letters of recommendation, the undergraduate record, and (if required) pre-entrance test scores on the Graduate Record Examination, Miller Analogies Test, etc. Some capable applicants do not show up well according to these criteria, although they sometimes turn out to be excellent students after admission. Often partime jobs, extra-curricular activities, lack of seriousness of purpose at an early age, or similar factors make a student's undergraduate record a poor gauge of his capabilities. The Graduate School, however, must judge as best it can from limited information, admittedly mak-

ing occasional errors in judgment. Letters of recommendation usually weigh heavily in these judgments, particularly when the author is a scholar held in high esteem by the faculty of the school to which application is made.

Entering graduate school for the first year without an award will not prejudice one's chances for a later award. In the spring of the first year, the graduate faculty reviews the progress of all current award holders and weighs the applications of others. Awards for the second and third years are made almost entirely as a result of the student's record in the graduate program. Thus, it is often a wiser course in the long run to enter a good graduate school without an initial award than to go to a much poorer school with modest financial aid. A poor education is never a bargain when viewed in the perspective of a lifetime career!

Awards to entering students at Duke are of three different kinds.

- 1. Fellowships range from \$2,000 to \$3,800 for the academic year. They are divided into two categories, those from the annual awards budgets of the individual departments, and certain "name fellowships" from special funds or endowments. Foremost among the latter are the \$3,800 James B. Duke Fellowships offered to outstanding students. Approximately twenty-five of these are offered to entering students each year in a competition that crosses departmental lines. These fellowships may be renewed for two years on good performance. Nominations are made by the individual departments from among the regular applicants for admission and award and are judged by a committee of the graduate faculty. Regular departmental fellowships usually range from \$2,000 to \$3,000, and are awarded upon recommendation by each department. Fellowship holders are expected to carry a full course load each semester.
- 2. Scholarships range from \$700 to \$1,800 for the academic year. Scholarship holders are also expected to carry a full course load each semester. Scholarships are awarded on recommendation by each department.
- 3. Graduate Assistantships range up to \$3,400 for the academic year. Assistantships normally require services of the student up to twelve hours a week and permit the students to register for a four-fifths course load. Assistantships are most common in the science departments, where the student often provides laboratory assistance to various members of the faculty. Most graduate assistants remain in residence for at least one of the Summer Sessions during their

first two years, carrying sufficient research or course credit so that they can complete their residence requirement of sixty units within two years. In this way, the normal progress towards a degree is not impeded by the reduced load during the fall and spring semesters. Departmental research funds are often available to provide financial assistance during the summer.

In addition to the graduate awards from University funds, other fellowships are available from foundation, government, or industry sources. Among those at the University's disposal are fellowships in the Commonwealth-Studies Program, for students in Political Science, Economics and History concentrating their studies on the British Commonwealth; Kearns fellowships in Religion; Ford Foundation fellowships in economic development; Lilly Foundation fellowships in Political Science; C. W. Hargitt research fellowships in Zoology; and Cokesbury awards for preparation for college teaching. Duke University also offers fellowships under the National Science Foundation Co-operative Program. In 1966-67 there were 135 students holding three-year fellowships awarded by Duke under the National Defense Education Act, in the fields of Biochemistry, Botany, Chemistry, Economics, Electrical Engineering, English, Forestry, History, Mathematics, Philosophy, Physics, Political Science, Psychology, Romance Languages, Sociology, Southeast Asia and Eastern Europe Area Studies, and Zoology. A number of other traineeships and assistantships are available in the sciences, Mathematics, and Psychology under grants from NASA, National Science Foundation, National Institutes of Health, and the United States Public Health Service, to a 1966-67 total of 92.

Duke has been among the leading universities of its size in attracting Woodrow Wilson Fellows. These fellowships, awarded by a national competition which permits the student to attend the university of his choice, are available only for the first year of graduate study. Duke has also been among the leading universities in the percentage of Woodrow Wilson Fellows who continued their studies with fellowship aid beyond the first year.

Subvention funds, granted to universities attended by Woodrow Wilson Fellows, are used at Duke to provide additional fellowships for advanced students committed to teaching as a career. Fellowships of approximately \$2,000 are awarded for work on the Ph.D. dissertations. From the same source a number of supplementary foreign travel grants for dissertation research are awarded each year,

awards covering travel expenses up to \$1,250. Since 1961 fellows have been in Australia, India, Cambodia, Spain, Ireland, England, France, Holland, and the Middle East.

Loan funds are also available for students who do not have sufficient financial resources at their disposal. Loans may be obtained either from the National Defense Act Loan fund or from University funds. These carry low interest charges and easy repayment terms. Further information may be obtained from the Graduate Office.

It is difficult to estimate a student's financial needs during the years of graduate study because of individual tastes and habits. One can predict with some accuracy, however, the three major items of expense at Duke: tuition and fees, \$1,410 for a full program for each of the first two years, normally \$282 for the Ph.D. dissertation year; room rent, \$310–380 each year in graduate dormitories; and board, approximately \$550–600 in graduate dining halls. Students holding awards are normally paid in eight equal installments beginning in October, and tuition and room fees are deducted monthly on a pro rata basis.

The costs of graduate education are high, but Duke University attempts to allocate its funds so that the superior student is able to finish his work for a degree in the normal length of time regardless of his personal financial resources. This is a contribution to the community of scholarship which the University is glad to bear.

The Duke University Graduate School

In surveying the progress made in the first seven years after the founding of Duke University, its first President, William Preston Few, wrote that he wanted "to see the Graduate School made strong because it will best and most quickly insure our attaining and maintaining a place of real leadership in the educational world . . . more than anything else here our Graduate School will determine the sort of University we are to build and its standing in the educational world." These opinions have continued to prevail to the present day, with emphasis upon the interdependence of teaching and research as the necessary components of scholarship.

Four hundred members of the graduate faculty teach the approximately five hundred courses and seminars offered in the Graduate School, and supervise thesis and dissertation research. Many of the major universities of the world have helped to train this faculty; approximately 90 percent of the graduate staff hold degrees from the

forty-one institutions which make up the Association of Graduate Schools within the Association of American Universities. By place of birth they represent almost every state in the Union and almost two dozen foreign countries.

The fourteen hundred graduate students currently enrolled represent a similar diversity in background. Approximately 48 per cent of students recently completing degrees are from undergraduate colleges in the Southeast, 18 per cent are from the Middle Atlantic states, 11 per cent are from the Central states, 10 per cent are from New England, 3 per cent are from the Far West, 1 per cent from the Southwest, 1 per cent from the Northwest, and 8 per cent from foreign countries. The old maxim that a university is only as good as its faculty might be amended by adding "and no better than its student body." No professor can give his wisdom to a student, and no student can take his understanding from another. This must be a reciprocal process between professor and student, and between student and student. The groundwork for learning may be laid in privacy —indeed a certain amount of private study and research is absolutely essential—but the vital stimulus to the learning process comes from one's contact with the minds of other men with similar or related interests. This is precisely why graduate schools are highly selective in their admissions policy, and it is one of the important reasons for their willingness to offer attractive fellowship awards to outstanding students. The superior student is a valuable catalyst both for his fellow students, and for his faculty, and is prized as such.

Faculty and students comprise the essential human factors in education, but their joint endeavor cannot prosper without adequate research and library facilities. Duke University is particularly fortunate in regard to research facilities, for the physics, botany, zoology, psychology, engineering and biochemistry laboratories have been built entirely within the last sixteen years, and modernization and expansion have occurred in other scientific areas. It is also the University's pride that it has one of the finest research libraries, the nineteenth largest university library in the nation today, second in the South, and first in the Southeast. In number of volumes, breadth of coverage, serials, and documents, it is a much more adequate library than that available in many graduate schools with enrollment two or three times as large. To the student in the arts, humanities, and social sciences, for whom the library is the bloodstream of scholarship, this is an immeasurable asset.

Among the many special features of the Graduate School may be mentioned a few of importance to various graduate programs. For students in the biological sciences, the facilities of the Duke Marine Laboratory at Beaufort, North Carolina, are available for course work and research. The Laboratory has research buildings, classrooms, motor vessels, including the 118-foot oceanographic ship, the R/V Eastward, and living quarters which make it one of the best research centers in marine biology in the country. Closer to home are the seven thousand acres of the Duke Forest, managed by the School of Forestry, ideal for research on timber growth, soils, and related topics. A large phytotron is under construction. Students in both the physical and the life sciences frequently avail themselves of the facilities of the Oak Ridge Institute of Nuclear Studies, of which Duke is one of the sponsoring universities.

In the social sciences the Commonwealth-Studies Center is internationally recognized for its graduate training and research program. It is today one of the major centers, from the point of view of both faculty and library resources, carrying on studies of the various areas of the British Commonwealth. The Center is a cooperative enterprise of the Political Science, Economics, and History departments. Other important graduate programs with an international orientation focus on Europe, South Asia, Sub-Sahara Africa, and South America.

Other special teaching or research programs include the Lilly Endowment program in Christianity and the social order, jointly conducted by the departments of Political Science and Religion; the Ford Foundation-sponsored program in gerontology, conducted by the departments of Sociology and Economics; a joint program in the anatomical, physiological and psychological aspects of behavior with support under the National Defense Education Act; a research workshop on economic development for advanced students; and numerous others such as the Cooperative Programs with the University of North Carolina in the Humanities and in Slavic Studies. Duke is also fortunate in having excellent Medical, Law, Forestry, and Divinity Schools on its main campus, thus making many additional facilities available for course or research work related to the graduate curricula in the arts and sciences. A two-term summer session and the availability of courses in the nearby University of North Carolina under a cooperative arrangement offer other opportunities to the graduate student.

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No description of programs can begin to give the prospective student the full flavor of graduate study in a particular institution. A visit to the universities one is particularly interested in may be helpful in giving one a better picture. If this should be practical, the Duke Graduate School offers a warm invitation to prospective students to come to the campus during the year to discuss their possible application and admission. The visitor will find at Duke most of the facilities that one could hope for in the largest of institutions, and yet the University has been fortunate in avoiding many of the evils inevitable with mass education. Despite the total University enrollment of approximately 7,200, Duke has retained the sense of community that one usually associates with a smaller liberal arts college. And in an age when current architectural whim often adds yet one more variant style to an already assorted array of buildings, Duke has built with foresight and design a campus of unusual beauty. This, too, is an important part of the fabric of education, creating an environment conducive to learning.

Pictorial representation of some of the facilities for graduate study at Duke University.





Library stacks and carrells for assignment to students engaged in graduate study.

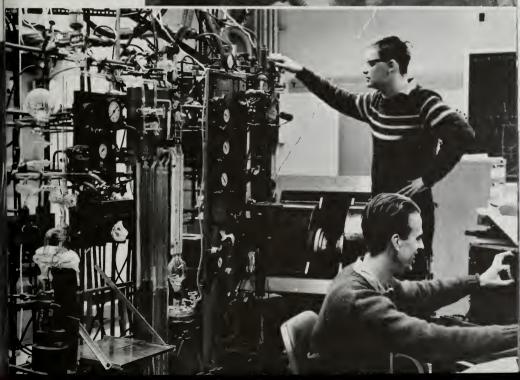


The Rare Book Room, which contains a number of notable collections and individual volumes.

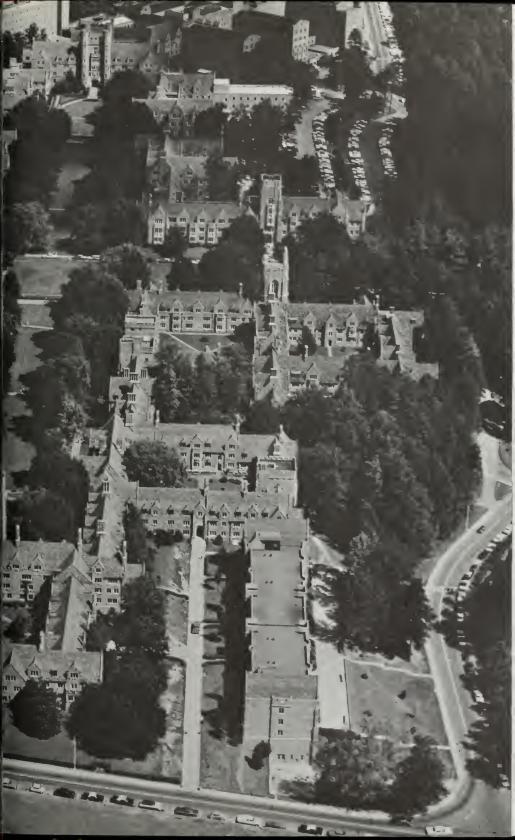


A graduate student in the Department of Physiology and Pharmacology is shown adjusting apparatus for perfusing isolated organs in blood.

Low temperature research in Department of Physics.









Biological Sciences Building housing the Departments of Botany, Forestry, and Zoology.

 \boldsymbol{A} history seminar, typical of seminars in the Social Sciences and Humanities.





Typical living room, partly furnished by the University in the 224 apartments provided for married graduate students.



udents browsing in the othic Bookstore.



Seven-thousand-acre Duke Forest, a vast laboratory for graduate study in forestry, botany, and zoology.

The 118-foot biological and oceanographic research vessel Eastward recently added to laboratories, classrooms, and residence facilities of the Duke University Marine Laboratory at Beaufort, N.C.



General Regulations Governing Graduate Studies

The official Graduate School *Bulletin*, published in February of each year, gives a detailed account of regulations concerning graduate work at Duke University and a full description of course content. The following pages are a summary of these materials for 1967–68, and should provide sufficient information for the prospective student. The *Bulletin* is normally mailed to each student who is admitted to the Graduate School in the late Spring of the year of matriculation so that he may plan his course program for the first year. Copies may be obtained in February, however, by writing to the Graduate School Office, Duke University.

Admission

Admission is granted at any of the registration periods—September and February for the academic year, June and July for the Summer Session—but the student who plans study mainly in the academic year should enter in September when more courses are scheduled and year courses begin. Closing dates for accepting applications are approximately as follows (see the *Bulletin* for exact dates).

Fall Semester, Admission and Award	February 15
Fall Semester, Admission Only	August 1
Spring Semester	January 1
Summer Session, First Term	May 13
Summer Session, Second Term	June 20

Basic prerequisites for admission to a master's program are an A.B. or B.S. granted after four years' study in an accredited institution, approximately a B average in a well-rounded program, and a substantial major in the intended graduate field. The student seeking admission should (1) secure an application form from the Dean of the Graduate School (2) complete and return it (3) request that two copies of transcript from any undergraduate or graduate institution attended be mailed promptly by the registrar directly to the Dean

of the Graduate School, and (4) request that three letters of recommendation, on forms available in the Graduate School Admissions Office, be sent to the Dean by persons able to estimate the applicant's capacity for successful graduate work. Two of these should represent your major field.

As additional evidence of capability, scores on the Graduate Record Examination, particularly the Aptitude Test, and on the Miller Analogies Test are strongly recommended in all departments and must be submitted if either test has been taken. Scores on the Graduate Record Examination may be requested of any applicant whose record is marginal and must be submitted by all applicants for a fellowship. Departments that require scores of all applicants are listed below:

	GRADUATE RECORD EXAMINATION		Miller
	Aptitude Test	Advanced Test	Analogies Test
Anatomy	×	×	
Biochemistry	×	X	
Botany	×	X	
Chemistry	×	X	
Economics	×	X	
English	×	X	
Forestry	×		
Geology	×		
German	×		
History	×		
Microbiology	×	X	
Mathematics	×		
Pathology	\times^1		
Philosophy	×		\times^2
Physics	×	X	
Physiology	×		
Political Science	×		
Psychology	×	X	×
Religion	×		
Romance Languages	×	X	
Sociology-Anthropology	×	X	
Zoology	×	×	

¹ If the candidate does not already hold an M.D. or D.V.M. degree he will be required to take the GRE Aptitude Test.

² Either GRE or MAT.

Information on times and places of the GRE examinations can be provided at the applicant's college or by the Educational Testing Service, 20 Nassau St., Princeton, New Jersey.

All applicants except non-degree students and foreign students applying from outside the United States must include an application fee of \$5.00 in check or money order payable to Duke University.

An applicant who has already earned a master's degree should

supply all the information outlined above including recent scores on the Graduate Record Examination and the Miller Analogies Test if these examinations have been taken.

When the application is complete and has been reviewed by the department and the Graduate School Office, a letter of notification will be sent to the applicant (notification will not be sent until March 21 for applications requesting a fellowship award). The process of admission is completed when the applicant has filled out and returned the acceptance form.

Admission may be of three types: *full*, without restriction; *provisional*, when some essential document is lacking or the record suggests the advisability of a trial period; *non-degree*, when the student desires transferable graduate credit for certification or for some other purpose but is not undertaking a degree program at Duke. Provisional status is reviewed when the deficiency has been corrected or after the student has completed 15 units of course work in the academic year or 12 units in the Summer Session. If, on review, the record is found satisfactory, the status is altered to full admission with credit from the time of first registration.

Qualified foreign students are welcomed and can be accommodated in most departments. In addition to admission documents required of all applicants, the foreign student must provide (1) scores on an approved examination in English showing that the applicant can read, write, speak, and understand English well enough to pursue a graduate program presented in English (unless he resides in an English-speaking country) (2) a statement certified by a responsible person that his finances are sufficient to maintain him during his stay at Duke University, and (3) a statement by a qualified physician describing any emotional or physical illness the applicant has had during the previous five years. In meeting closing dates, foreign students should observe the time for mail to reach Durham.

Details of registration appear in the *Bulletin* and will be sent to all admitted applicants prior to the registration period. A normal full program includes four or five courses or seminars totaling 15 units per semester.

Transfer graduate credit may be accepted in a master's program up to 6 units but will not reduce the total fee-unit requirement here. An applicant for a doctoral program who has earned a master's degree may be granted transfer credit up to 30 units toward the required minimum of 60 units.

Earning the Degrees

Duke University offers graduate programs leading to the specified advanced degrees in the following fields:

Anatomy, A.M., Ph.D. Biochemistry, A.M., Ph.D. Botany, A.M., Ph.D. Chemistry, A.M., Ph.D. Civil Engineering, M.S., Ph.D. Classical Studies, A.M., Ph.D. Economics, A.M., Ph.D. Education, M.Ed., M.A.T., A.M., Ed.D., Ph.D. Electrical Engineering, M.S., Ph.D. English, A.M., Ph.D. Forestry*, A.M., M.S., Ph.D. Geology, A.M. Germanic Languages and Literature, A.M. History, A.M., Ph.D.

Hospital Administration, M.H.A. Mathematics, A.M., Ph.D. Mechanical Engineering, M.S. Microbiology and Immunology, A.M., Ph.D. Pathology, A.M., Ph.D. Philosophy, A.M., Ph.D. Physics, A.M., Ph.D. Physiology, A.M., Ph.D. Political Science, A.M., Ph.D. Psychology, A.M., Ph.D. Religion*, A.M., Ph.D. Romance Languages, A.M., Ph.D. Sociology and Anthropology, A.M., Ph.D. Zoology, A.M., Ph.D.

* In addition to the regular advanced degrees in the Graduate School of Arts and Sciences, the School of Forestry offers the professional degrees of Master of Forestry and Doctor of Forestry, and the Divinity School the degrees of Bachelor of Divinity, Master of Religious Education, and Master of Theology.

Programs leading to graduate degrees include course and seminar study prescribed by the individual departments; evidence of command of and training in the tools of research including foreign languages; guided and independent reading and laboratory and field experience; a period of residence with constant easy access to the library, laboratory, senior professors, and other graduate students; certain oral and written examinations to exhibit command of the declared field of study; and a thesis or dissertation as a public account of a body of knowledge the student has mastered. A final examination, generally focused upon the thesis or dissertation, enables the student to convince the graduate staff that he has fulfilled his intentions. Time limitations are set for completion of the program so that the initial ambition in undertaking graduate study and the momentum of accomplishment are not lost.

The Language Requirement

Before admission the student may need to know the language requirements for which he should prepare. A requirement for the A.M. is command of one acceptable ancient or modern foreign language (French, German, Russian, and others if appropriate and ap-

proved) evidenced by an objective examination offered during the first registration period or by reading examinations at other scheduled times. (There is no language requirement for the M.Ed., M.A.T., M.H.A., or M.S. degrees.) A requirement for the Ph.D. is command of two acceptable foreign languages. (There is no language requirement for the Ed.D. degree.) Acceptable command will be shown by (1) the objective examination in French, German, or Spanish upon first registration (2) in French, German, and Russian by scores of the E.T.S. tests in those languages offered at nationally set dates by the Duke Bureau of Testing and Guidance and other examining centers (3) in Spanish and Italian by departmental reading examination, and (4) in other languages by special arrangements. Doctoral language requirements must have been met before the student is admitted to the preliminary examination.

Foreign students whose native language is not English will be examined during their first registration period in their use of English, and those found deficient will be required to enroll in the course entitled English for Foreign Students. Advanced level non-credit reading courses in French and German are provided for students who need them.

Other Requirements

General requirement for a master's degree is a *minimum* of 30 units (semester hours) of course-seminar-research credit. If a thesis is presented (required for the A.M. and the M.S., optional for the M.Ed. and the M.A.T.), at least 24 units are allotted to course-seminar work and at least 6 units to thesis research. In the M.A.T. program practice teaching is included for students who lack it, and for them the total units required become a minimum of 36. A pattern of major and minor is prescribed for the course-seminar work, allotting half or more of the units to the major. For example, in the M.S. program (engineering and forestry only) up to half the units may be in appropriate fields outside of those majors; the M.Ed. allows at least half the units to fall within the student's teaching field; and the M.A.T. allows a major in either Education or teaching fields according to the student's previous training.

A master's program can be completed in one academic year, but the student who presents a thesis normally needs at least a calendar year, and foreign students should be prepared to study for two years. The maximum span of time permitted from first registration to completion of all requirements is six years.

Course-seminar-research requirement in the doctoral program is a minimum of 60 units, but the proportions of course-seminar work and research are generally flexible according to the student's needs. The applicant who has already earned the A.M. or M.S. (or for a degree in Religion, the B.D.), after establishing the quality of his work here, may be granted transfer credit to a maximum of 30 units (i.e., the equivalent of one year of residence). The dissertation is expected to be a mature and competent piece of writing, embodying the results of original and significant research. All dissertations will be published on microfilm, and the author may retain copyright privileges.

Fairly strict time limitations are set for completion of the doctoral program. The preliminary examination, which may be taken only after language and course-seminar requirements have been met, and which formally admits a student to candidacy for the degree, should normally be passed by the end of the second year and must be passed by the end of the third. The interval between preliminary examination and presentation of an acceptable dissertation should normally be one to two years and may not be more than four years without special approval by the Dean. Should this interval extend beyond five years, a second preliminary examination becomes necessary.

The program for the Ed.D., with no language requirement, is distinctive in that in place of the usual dissertation the candidate, after a year of employment in an administrative or teaching position, may deal with a problem growing out of this experience.

Financial Regulations

Tuition and fees are charged at the rate of \$47.00 per unit (a unit is roughly equivalent to a semester hour), with the normal full program of study being 30 units for an academic year. Upon successful completion of preliminary examinations and at least 60 units of course-seminar-research credits, the normal full program during the dissertation period is 3 units per semester while in residence, or 1 unit per semester while not in residence. The basic necessary expenses for a year of graduate study, assuming one lives in University graduate dormitories, are therefore approximately as follows:

	1st and 2nd Year	Dissertation Year
Tuition and Fees	\$1410	\$ 282
Room Rent*	310	310
Board	550	550
	\$2270	\$1142

^{*} Subject to change.

Additional allowances should be made for books, laundry, and other personal expenditures.

Information on fellowships, scholarships, assistantships and loan provisions is summarized in Part 1, above, pages 13-17.

Housing is provided for approximately 310 single men and 60 single women in the Graduate Center, for 38 single women in Hanes Annex, and for 224 married couples in Duke University Apartments. The Town House Apartments, acquired by Duke in 1966, will accommodate 3 women in each of the 26 air-conditioned apartments.

* * * * * *

The applicant who wishes further information on facilities and regulations on course programs not covered in this booklet is invited to write to the Director of Admissions of the Graduate School, or the Director of Graduate Studies in the department of intended study.

Calendar of the Graduate School

Summer Session 1967*

First Term—June 12—July 18 Second Term—July 20—August 25

Academic Year 1967-68

First Semester—September 19—January 26 Second Semester—February 1—June 3

Sept. 19 Registration for First Semester
Sept. 21 Classes Begin
Nov. 22-Nov. 27 Thanksgiving Recess
Dec. 20-Jan. 3 Christmas Recess
Jan. 26 End of First Semester
Jan. 31 Registration for Second Semester
Feb. 1 Classes Begin
March 23-April 1 Spring Recess
May 29 End of Second Semester
June 3 Commencement
* Fee increases effective September, 1967, do not apply to the 1967 Summer Session.

Advanced Degree Programs at Duke

(For full course descriptions including credit and name of instructor see the complete *Bulletin*. Courses offered annually bear no date; those offered only when the demand warrants bear an asterisk.)

Anatomy

The Department of Anatomy offers graduate courses and training leading to the A.M. and Ph.D. degrees. Further information may be obtained from the Director of Graduate Studies of the Department.

Professors

John Wendell Everett, Ph.D. (Yale); Joseph Eldridge Markee, Ph.D. (Chicago), James B. Duke Professor of Anatomy; Montrose J. Moses, Ph.D. (Columbia); Talmadge Lee Peele, M.D. (Duke); J. David Robertson, M.D., Ph.D. (M.I.T.), Chairman.

Associate Professors

Roland Frederick Becker, Ph.D. (Northwestern); John Buettner-Janusch, Ph.D. (Michigan); Kenneth Lindsay Duke, Ph.D. (Duke), Director of Graduate Studies.

Courses of Instruction

M201. Anatomy as Related to Locomotion

M202. Microscopic Anatomy

M203. Anatomy of the Nervous System M204. Neuroanatomical Basis of

Behavior

M205. Anatomy of the Viscera

M231. Physical Anthropology

M232. Human Genetics

M244. Topics in Cell Structure and Function

T unction

M301. Gross Human Anatomy

M312. Research

M313-314. Anatomy Seminar

M378. Reproduction

Art

No graduate degree is offered in this department, but the following courses are suggested as possible minors for students majoring in history, literature, philosophy, religion, psychology, or sociology-anthropology, or in any other interested departments.

Professors

Louise Hall, Ph.D. (Radcliffe); William S. Heckscher, Ph.D. (Hamburg), Chairman; Sidney David Markham, Ph.D. (Columbia); Ransom Rathbone Patrick, Ph.D. (Princeton).

Adjunct Professor

Justus Bier, Ph.D. (Zurich).

Associate Professor

Elizabeth Read Sunderland, Ph.D. (Radcliffe).

Courses of Instruction

217. Aegean Art

218. Early Greek Art

221-222. History of Aesthetics (1967-68)

233. Early Mediaeval Architecture*

234. Romanesque Sculpture*

239. Architecture of Britain

240. Architecture of North America

249. Pre-Columbian Art

250. Latin American Art

251, 252. Research

292. Research Problems in the Collections of the North Carolina Museum of Art (Spring, 1966)

Biochemistry and Nutrition

Graduate work in the Department of Biochemistry is offered leading to the Ph.D. degree. Preparation for such graduate study may take diverse forms. Undergraduate majors in chemistry, biology, mathematics or physics are welcomed, but adequate preparation in chemistry is essential. Graduate specialization areas include protein structure, enzyme action, metabolism, and genetic mechanisms.

Professors

Mrs. Mary L. C. Bernheim, Ph.D. (Cambridge); Eugene A. Davidson, Ph.D. (Columbia); Samson S. Gross, Ph.D. (Columbia); Walter R. Guild, Ph.D. (Yale); Philip Handler, Ph.D. (Illinois), Chairman and James B. Duke Professor; Robert Hill, Ph.D. (Kansas); Henry Kamin, Ph.D. (Duke); Charles Tanford, Ph.D. (Princeton); Ralph E. Thiers, Ph.D. (London); Salih Wakil, Ph.D. (Washington).

Associate Professors

William L. Byrne, Ph.D. (Wisconsin); Irwin Fridovich, Ph.D. (Duke), Director of Graduate Studies; Norman Kirshner, Ph.D. (Pennsylvania State); William Sanford Lynn, M.D. (Columbia); Kenneth McCarty, Ph.D. (Columbia).

Assistant Professors

Ronald C. Greene, Ph.D. (California Institute of Technology); K. V. Rajagopalan, Ph.D. (University of Madras); Theodore R. Rosett, Ph.D. (London); Robert W. Wheat, Ph.D. (Washington University).

Courses of Instruction

201. Introductory Biochemistry

203. Chemistry of Natural Products

204. Introductory Genetics

206. Laboratory Methods in

Biochemistry

M241. General Biochemistry (for

medical students)

301. Energy Metabolism

302. Nitrogen Metabolism

304. Proteins and Enzymes

315. Molecular Genetics

345-346. Seminar

348. Special Topics*

351-352. Genetics Seminar

354. Biochemistry of Disease*

Botany

Graduate work in the Department of Botany is offered leading to the A.M. and Ph.D. degrees. Before undertaking graduate study in botany a student should have had in his undergraduate program at least 12 semester hours of botany beyond an elementary course, and related work in biological sciences. Some work in chemistry and physics will be desirable and, for some phases of botanical study, a necessity. Graduate Record Examination scores are required of all applicants. The student's graduate program is planned to provide a broad basic training in the various fields of botany, plus intensive specialization in the field of the research problem.

Professors

Lewis Edward Anderson, Ph.D (Pennsylvania); William Dwight Billings, Ph.D. (Duke), Director of Graduate Studies; Ellwood Scott Harrar, Ph.D. (Syracuse); Henry Hellmers, Ph.D. (California, Berkeley); Terry W. Johnson, Jr., Ph.D. (Michigan), Chairman; Paul Jackson Kramer, Ph.D. (Ohio State), James B. Duke Professor of Botany; Aubrey Willard Naylor, Ph.D. (Chicago); Henry John Oosting, Ph.D. (Minnesota); Harold Sanford Perry, Ph.D. (Cornell).

Associate Professors

William L. Culberson, Ph.D. (Wisconsin); Jane Philpott, Ph.D. (State University of Iowa); Donald Eugene Stone, Ph.D. (California, Berkeley); Robert L. Wilbur, Ph.D. (Michigan).

Assistant Professors

Richard A. White, Ph.D. (Michigan); Richard Searles, Ph.D. (California, Berkeley).

Courses of Instruction

202. Genetics

205. Anatomy

209. Lichenology

210. Bryology

212. Phycology

221. Mycology 225-226. Special Problems

240. Evolution

242. Systematics

243. Cytology (listed also as Zoology

243)

245. Morphology

246. Ecology

251. Physiology

252. Plant Metabolism

254. Plant-Water Relations

255. Plant Systematics

256. Community Analysis and Classification

257. Principles of Plant Distribution

258. Physiology of Growth and Development

259. The Environment

305. Vegetation of North America

359-360. Research in Botany

Marine Laboratory

Four marine botany courses are given in the Duke University Marine Laboratory, Beaufort, N. C.; S205, Marine Microbiology (Not 1967); S207, Marine Mycology (Not 1967); S211, Marine Phycology; S220 Coastal Field Botany.

Chemistry

In the Department of Chemistry graduate work is offered leading to the A.M. and Ph.D. degrees. Before undertaking a graduate program in chemistry, a student should have taken an undergraduate major in chemistry along with related work in mathematics and physics.

Graduate courses in the department are designed to provide a broad basic training in the fields of inorganic, analytical, organic, and physical chemistry. An important requirement for the Ph.D. degree is the successful completion, under the direction of a member of the staff, of a research program leading to the solution of an original problem. The choice of the research program, for either the A.M. or the Ph.D. degree, will determine the field of advanced specialization.

Professors

Charles Kilgo Bradsher, Ph.D. (Harvard), James B. Duke Professor and Chairman; Frances Campbell Brown, Ph.D. (Johns Hopkins); Charles Roy Hauser, Ph.D. (Iówa), James B. Duke Professor; Douglas Greenwood Hill, Ph.D. (Princeton); Marcus Edwin Hobbs, Ph.D. (Duke); William R. Krigbaum, Ph.D.

(Illinois); Howard Austin Strobel, Ph.D. (Brown); Pelham Wilder, Jr., Ph.D. (Harvard).

Associate Professors

Donald B. Chesnut, Ph.D. (California Institute of Technology); Jacques C. Poirier, Ph.D. (Chicago); Louis DuBose Quin, Ph.D. (North Carolina), Director of Graduate Studies; Peter Smith. Ph.D. (Cambridge).

Assistant Professors

Peter W. Jeffs, Ph.D. (Natal); Leon Lloyd Jones, Ph.D. (Utah); Richard A. Palmer, Ph.D. (Illinois); Richard LeRoy Wells, Ph.D. (Indiana).

Adjunct Professor

Anton Peterlin, Ph.D. (University of Berlin).

Courses of Instruction

- 216. Nuclear Chemistry
- 217. Inorganic Chemistry
- 234. Chemical Instrumentation
- 235. Advanced Analytical Chemistry
- 251. Qualitative Organic Analysis
- 252. Advanced Organic Preparations
- 253. Intermediate Organic Chemistry
- 255. Structural Analysis by Spectroscopic Methods
- 263. Thermodynamics
- 267. Introductory Quantum Chemistry
- 271. Introduction to Research
- 275-276. Research
- 306. Special Topics in Physical Chemistry
- 315. Advanced Inorganic Chemistry
- 317, 318. Seminar in Inorganic Chemistry
- 331, 332. Seminar in Analytical Chemistry

- 350. Organic Reactions
- 352. Mechanisms of Organic Reactions
- 354. Stereochemistry
- 355. Special Topics in the Chemistry of Natural Products
- 356. Heterocyclic Chemistry (not 1967-68)
- 360. Polymer Chemistry
- 361. Advanced Polymer Chemistry
- 362. Kinetics of Chemical Reactions (not 1967-68)
- 364. Advanced Topics in Physical Chemistry (not 1967-68)
- 365. Introductory Statistical Mechanics
- 366. Statistical Mechanics (not 1967-68)
- 368. Quantum Mechanics
- 373, 374. Seminar

Classical Studies

The Department of Classical Studies offers programs leading to the M.A. (and M.A.T.) and Ph.D. degrees with majors in Greek, Latin, and Ancient History and minors in these, Archaeology, and Linguistics. For regular admission to a major in Greek or Latin a student must offer three years of college study above the elementary level in one language and two college years in the other. Students wishing to major in Ancient History will be required on entrance to demonstrate satisfactory competence in both Greek and Latin for reading in the primary sources; failure to demonstrate such competence will require modification of the student's program to repair deficiency.

The Department's special requirements of students in addition to the general requirements of the University for the M.A. and for the Ph.D. are presented in a sheet which may be obtained from the Director of Graduate Studies. They include for the M.A. a major and a minor field and for the Ph.D. a major and two minor fields, all to be chosen within the general discipline of Classical Studies; an Introductory Colloquium at entrance; a reading list; a comprehensive examination at the end of the first year of residence; and special requirements in seminar and course work and in the preliminary examination for the Ph.D. degree.

Professors

Lawrence Richardson, Jr., Ph.D. (Yale), F.A.A.R., Chairman and Director of Graduate Studies; Robert Samuel Rogers, Ph.D. (Princeton), F.A.A.R.; James N. Truesdale, Ph.D. (Duke); William H. Willis, Ph.D. (Yale).

Visiting Professor (second semester)

Berthe M. Marti, Ph.D. (Brvn Mawr).

Assistant Professors

Dennis Keith Stanley, Ph.D. (Johns Hopkins); C. Hilburn Womble, Jr., Ph.D. (Johns Hopkins); Allan D. Wooley, Ph.D. (Princeton).

Courses of Instruction

Greek

203. Homer

205. Greek Lyric Poets

206. Aeschylus

208. Sophocles

209. Euripides 210. Aristophanes

221. Early Greek Prose

222. Thucydides

223. Greek Orators I

224. Greek Orators II

225. Plato

231. Hellenistic Poetry

241. Advanced Prose Composition

301. Greek Seminar I

303. Greek Seminar II

304. Greek Seminar III

311. Papyrology

313. Greek Epigraphy

321. Seminar in Literary Papyri 323. Seminar in Documentary Papyri

Latin

201. The Verse Treatise

202. Roman Satire

203. Epic: Vergil204. Epic: Lucan and Statius

205. Mediaeval Latin I

206. Mediaeval Latin II

207. The Prose Epistle

208. The Epistle in Verse

209. Fragments of Early Latin

210. Lyric and Occasional Poetry

211. Roman Oratory I

212. Roman Oratory II

241. Advanced Latin Composition

301. Latin Seminar I

303. Latin Seminar II

304. Latin Seminar III 312. Latin Palaeography

314. Latin Epigraphy

315. Roman Law

Classical Studies

301. Introduction to Classical Philology

Classical Studies (Ancient History)

253. Greece to the Orientalizing Period

254. The Age of the Tyrants and the Persian Wars

255. The Age of Pericles

256. The Fourth Century through Alexander

257. Social and Cultural History of the Hellenistic World from Alexander to Augustus

258. Social and Cultural History of the Graeco-Roman World

260. The History of Rome to 146 B.C. 261. The Roman Revolution, 146-30

262. Rome under the Julio-Claudians

263. From the Flavian Dynasty to the Severan

321. Seminar in Ancient History I

322. Seminar in Ancient History II

323. Seminar in Ancient History III

Classical Studies (Archaeology)

231. Greek Sculpture232. Greek Painting

235. Roman Architecture

236. Roman Painting

311. Archaeology Seminar I 312. Archaeology Seminar II

Comparative Literature

No graduate degree is offered in Comparative Literature. The following courses may serve in the minor programs of students in other departments. Consult Professor Salinger, Chairman of the Department of Germanic Languages and Literature.

Courses of Instruction

201, 202. Romanticism (not 1967-68)
203, 204. Realism and Symbolism
(1967-68)
205. Foundations of Twentieth-Century
European Literature*

Economics

The Department of Economics offers graduate work leading to the A.M. and Ph.D. degrees. A student entering graduate work in economics should have completed with satisfactory grades at least 12 semester hours of undergraduate work in economics, including 6 hours of Principles of Economics. Among the undergraduate courses of distinct advantage to the graduate student in economics are General Accounting, Elementary Statistics, Intermediate Economic Theory, Money and Banking, International Trade, and basic courses in philosophy, psychology, mathematics, and social sciences other than economics.

Requirements for the Ph.D. in economics include a core of courses in Mathematical Economics, Statistical Methods, Micro- and Macro-economic Theory, Monetary Theory, Economic History, and the History of Economic Thought. Economic Growth and Demography, Money and Banking, International Trade, Economic Systems, Labor Economics, Public Finance, Industrial Organization, and Econometrics are optional fields, of which the student elects at least three in preparation for the preliminary doctoral examination. Course requirements for the Ph.D., including a minor field, may be completed in four semesters of residence.

Professors

Martin Lee Black, Jr., C.P.A., M.B.A. (Northwestern); David George Davies, Ph.D. (University of California, Los Angeles); Frank Traver de Vyver, Ph.D. (Princeton); Charles Elmo Ferguson, Ph.D. (North Carolina); Frank Allan Hanna, Ph.D. (Wisconsin); Calvin Bryce Hoover, Ph.D. (Wisconsin), Litt.D., James B. Duke Professor of Economics; John Seneca McGee, Ph.D. (Vanderbilt); Simon Rottenberg, Ph.D. (Harvard); Lloyd Blackstone Saville, Ph.D. (Columbia); Robert Sidney Smith, Ph.D. (Duke), James B. Duke Professor of Economics, Chairman; Joseph John Spengler, Ph.D. (Ohio State), L.H.D., James B. Duke Professor of Economics; William Poe Yohe, Ph.D. (Michigan), Director of Graduate Studies.

Visiting Professor

G. D. McColl, M.Sc. (London).

Associate Professors

John O. Blackburn, Ph.D. (University of Florida); Louis De Alessi, Ph.D. (University of California, Los Angeles); Craufurd D. Goodwin, Ph.D. (Duke); Thomas N. Naylor, Ph.D. (Tulane).

Assistant Professors

Apostolos Condos, Ph.D. (Iowa State); J. Michael Finger, B.A. (Texas); John Vernon, Ph.D. (M.I.T.); William H. Wallace, Ph.D. (Illinois).

Courses of Instruction

233. State and Local Finance

237-238. Statistical Methods

243, 244. Econometrics

262. Trade Unionism and Collective Bargaining

275-276. Advanced Industrial Accounting and Management

301. Economic Analysis

304, 305. Seminar-Money and Banking

307, 308. Quantitative Analysis

311, 312. History of Political Economy 313, 314. Seminar—Economic Theory

315. Seminar-Economic Systems

316. Seminar-Economic Functions of the State

317. Seminar-Demographic, Population, and Resource Problems

319. Seminar-Theory and Problems of Economic Growth and Change

320. Seminar—Trade Cycles, Employment, and Income Theory

329. Federal Finance

330. Seminar—Public Finance331. Seminar—Economic History

340. National Income

355. Seminar—Labor Economics

358. Seminar-Labor Market and Related Analysis

365. Seminar—International Economics

366. Seminar-Problems in International Trade and Finance

386. Seminar-Latin-American Economic Problems

388. Seminar—Industrial Organization 389. Seminar—Industrial and Govern-

mental Problems

401. Seminar—British Commonwealth

Education

Graduate work in Education is offered leading to the A.M., the M.Ed., the M.A.T., the Ed.D., and the Ph.D. degrees. For each of these degrees there are specific requirements and prerequisites, all of which may be found stated in detail in the Bulletin. Departmental requirements and prerequisites for all of these degrees may be obtained from the Director of Graduate Studies.

From the courses listed below, plus several in related disciplines, a selection may be made which will meet North Carolina requirements for the advanced Principal's Certificate and the Superintendent's Certificate. (Some courses below are offered only in the Summer Session; see the Summer Session Bulletin.)

These programs are accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers and school service personnel with the Doctor's degree as the highest degree approved.

Professors

Edward Claude Bolmeier, Ph.D. (Chicago), Director of Graduate Studies; Francis E. Bowman, Ph.D. (Harvard); William H. Cartwright, Ph.D. (Minnesota); Sherwood Githens, Jr., Ph.D. (North Carolina); Everett H. Hopkins, M.A., LL.D. (Wittenberg); Allan S. Hurlburt, Ph.D. (Cornell); Roland H. Nelson, Jr., Ed.D. (Harvard), Chairman; Olan Lee Petty, Ph.D. (Iowa); Wippert A. Stumpf, Ph.D. (Chicago).

Associate Professors

Robert Merle Colver, Ed.D. (Kansas); W. Scott Gehman, Jr., Ph.D. (Pennsylvania State); R. Baird Shuman, Ph.D. (Pennsylvania); Robert L. Spaulding. Ph.D. (Stanford); Henry L. Sublett, Ed.D. (Virginia); Henry Weitz, Ed.D. (Rutgers).

Assistant Professors

Robert H. Ballantyne, Ed.D. (Washington State); Peter F. Carbone, Ed.M. (Harvard); David V. Martin, Ed.D. (Duke); Ronald Simono, Ph.D. (Wisconsin).

Lecturer

Max D. Engelhart, Ph.D. (Illinois).

Courses of Instruction

- 201. Teaching and Supervision of Arithmetic
- 203. Principles of School Administration
- 204. The School as an Institution
- 205. Curriculum Problems in Secondary Education*
- 206. Philosophical Analysis of Educational Concepts
- 210. Introduction to Educational Research
- 211. The Problem Child
- 212. Statistical Methods for Educational Research
- 213. Elementary School Organization and Administration*
- 215. Secondary Education: Principles
- 216. Secondary Education: Internship
- 217. The Psychological Principles of Education
- 223. Teaching the Language Arts
- 224. Teaching the Social Studies in Elementary Schools
- 225. The Teaching of History and the Social Studies
- 226. Teaching Reading in the Elementary School
- 232. Supervision of Instruction*
- 233. Improvement of Instruction in English
- 234. Secondary School Organization and Administration
- 236. Teaching Reading in the Secondary School
- 237. The Teaching of Literature in Secondary Schools
- 238. Remedial Reading—Principles and Practice
- 239. The Teaching of Grammar, Composition, Mechanics, and Usage in Secondary Schools

- 240. Educational and Occupational Information*
- 241. Principles of Guidance
- 242. Measurement of Aptitude, Interest, and Achievement
- 243. Personality Dynamics
- 244. Counseling Techniques
- 246. The Teaching of Mathematics248. Practicum in Counseling
- 249. Introduction to Exceptional Children (listed also as Psychology 249)
- 250, 251. Teaching Emotionally Disturbed Children: Internship
- 252. The School in the Legal Structure
- 253. School Law
- 258. Educational Measurements
- 266. Science in the Elementary School*
- 276. The Teaching of High School Science
- 285. Audio-Visual Aids in Education*
- 290. Administration of School Property*
 291. Public and Community Relation of
- Schools*
 315. Seminar—Secondary School Teach
 - ing
- 323. Public School Finance*
- 333. Seminar in Higher Education*
- 335-336. Seminar in School Administration
- 337. Seminar in Community College Organization
- 338. Seminar in Educational Supervision
- 339. Seminar in Curriculum
- 340. Seminar in Social Studies Curriculum
- 341. Seminar in Elementary School Curriculum
- 350, 351. Directed Activities in School Administration
- 354. Seminar in School Law*

Engineering

James Lathrop Meriam, Ph.D., Dean Charles Rowe Vail, Ph.D., Associate Dean for Graduate Study and Research

The School of Engineering offers programs of study and research leading to the degrees of Master of Science with a major in civil, electrical, or mechanical engineering and Doctor of Philosophy with a major in civil or electrical engineering. These programs are designed to provide a fundamental understanding of the science of engineering, which is based on mathematics and the physical sciences, as well as a basic understanding of the art of engineering, which depends on human imagination and judgment. Each Engineering graduate student participates in seminars appropriate to his field of study.

A minimum of 30 units of earned graduate credit beyond the Bachelor's degree is required for the M.S. degree: 12 in engineering, 6 in related minor

work (normally mathematics or natural science), 6 in either the major or minor subject or in other areas approved by the major department and the Dean of the School of Engineering, and 6 for a research-based thesis. There is no

language requirement for this degree.

A minimum of 60 units of earned graduate credit beyond the Bachelor's degree is required for the Ph.D. degree: 24 in engineering, 12 in related minor work (normally mathematics or natural science), 12 in either the major or minor subject or other areas approved by the major department and the Dean of the School of Engineering, and 12 for a research-based dissertation. In addition, a reading knowledge of two foreign languages which are relevant to the field of the dissertation is required (normally two of the following: French, German, or Russian). The Directors of Graduate Studies will, during the first period of full-time registration of each doctoral aspirant, appoint a Program Advisory Committee consisting of three members of the Graduate Faculty in areas relevant to the student's intended major. The preliminary examination may be either written, oral, or a combination of written and oral components. at the discretion of the Committee.

Civil Engineering

A student may specialize in one of the following fields of study for either the M.S. or the Ph.D. degree: engineering mechanics, hydraulic engineering, materials science, sanitary engineering, soil and foundation engineering, or structural engineering. Appropriate combinations of these fields are also encouraged. Each graduate student participates in seminars appropriate to his field of study.

Under the Reciprocal Agreement with the Consolidated University of North Carolina, a student may include as a portion of the minimum requirements work offered by the Department of Environmental Science and Engineering of the University of North Carolina. Although minor work normally is taken in the natural sciences or mathematics, a student whose major interest relates to the social sciences may take relevant minor work in this area.

A minimum prerequisite to the graduate program in civil engineering is a basic knowledge of mathematics through linear differential equations, materials science, solid mechanics, and fluid mechanics.

Professors

Earl I. Brown, II, Ph.D. (Texas), J. A. Jones Professor of Civil Engineering, Chairman; Edward H. Bryan, Ph.D. (Wisconsin); James Lathrop Meriam, Ph.D. (Yale); Aleksandar Sedmak Vesić, D.Sc. (Belgrade), Director of Graduate Studies.

Visiting Professors

Paul W. Abeles, D.Sc. (Vienna); J. B. B. Owen, Ph.D. (Cambridge).

Associate Professors

Furman W. Barton, Ph.D. (Illinois); David W. Hill, Ph.D. (Stanford), Acting Chairman; Sudhir Kumar, Ph.D. (Pennsylvania State).

Assistant Professor

Paul Harrawood, Ph.D. (North Carolina State University).

Courses of Instruction

CE 201. Advanced Mechanics of Materials

CE 202. Experimental Stress Analysis

CE 205. Applied Elasticity

CE 211. Mechanical Behavior of Materials

CE 212. Structural Materials

CE 221. Incompressible Fluid Flow

CE 231. Structural Engineering

CE 232. Reinforced Concrete Design

CE 235. Foundation Engineering

CE 243, 244. Sanitary Engineering Unit Operations and Process Design

CE 250. Engineering Analysis CE 297, 298. Thesis Research

CE 302. Theory of Plates and Shells

CE 303. Introduction to Elastic Stability

CE 321. Mechanics of Ideal Fluids

CE 322. Mechanics of Viscous Fluids

CE 331, 332. Advanced Structural Design and Analysis

CE 335. Mechanical Behavior of Soils CE 336. Advanced Soil Mechanics

CE 365. Advanced Topics in Civil Engineering

CE 399. Special Readings in Civil Engineering

Electrical Engineering

A student may specialize in any one of the following fields in working toward either the M.S. or the Ph.D. degree: solid-state materials and devices; ferromagnetics; superconducting circuits; instrumentation; electronics; microwaves; computers and automatic control; energy conversion; information processing; and biomedical engineering.

A minimum prerequisite to the graduate courses in electrical engineering is a basic knowledge of differential equations, electric and magnetic field theory, and the theory of networks. A previous course in modern physics is recommended.

Professors

John Leslie Artley, D.Eng. (Johns Hopkins); Otto Meier, Jr., Ph.D. (Pennsylvania); Harry Ashton Owen, Jr., Ph.D. (North Carolina State); Charles Rowe Vail, Ph.D. (Michigan); Thomas George Wilson, Sc.D. (Harvard), Chairman.

Associate Professors

Robert Mercer Burger, Ph.D. (Brown), Adjunct; Robert Blackburn Kerr, D.Eng. (Johns Hopkins), Director of Graduate Studies; Theo Clyde Pilkington, Ph.D. (Duke); Bruce Arrington Wells, M.S.E.E. (Oregon State).

Assistant Professors

Rhett Truesdale George, Ph.D. (Florida); Herbert Hacker, Ph.D. (Michigan); William Thomas Joines, Ph.D. (Duke); Loren William Nolte, Ph.D. (Michigan).

Lecturer

Philip Harold Trickey, M.S.E.E. (Maine).

Courses of Instruction

EE 203. Random Signals and Noise

EE 204. Information Theory and Communication Systems

EE 205. Signal Detection and

Extraction Theory

EE 206. Switching and Logic Networks EE 211. Solid State Theory

EE 212. Solid State Materials

EE 213. Principles of Magnetism

EE 215. Semiconductor Physics

EE 217. Masers

EE 222. Nonlinear Analysis

EE 225. Semiconductor Electronic Circuits

EE 227. Network Synthesis

EE 241. Linear Control Systems

EE 244. Selected Topics in Control Systems

EE 259. Advanced Electric Energy Conversion

EE 265. Advanced Topics in Electrical Engineering

EE 271. Electromagnetic Theory

EE 272. Applications of Electromagnetic Theory

EE 304. Advanced Statistical Analysis and System Design

EE 311. Quantum Theory of Materials

EE 313. Magnetic Processes in Materials

EE 315. Semiconductor Devices

EE 321. Nonlinear Magnetic and Semiconductor Circuits

EE 324. Nonlinear Oscillations in Physical Systems

EE 342. Introduction to Optimal Control Theory

EE 361, 362. Electrical Engineering Seminar-Journal

EE 371. Advanced Electromagnetic Theory

EE 373. Selected Topics in Field Theory

EE 375. Interaction of Electron Beams and Waves

EE 399. Special Readings in Electrical Engineering

Mechanical Engineering

Graduate study is available to students seeking the M.S. degree with a major in mechanical engineering. Emphasis is placed on advanced study, research and design in three primary areas: thermal and fluid systems, design and control of machines and processes, and the development of materials. In the early stages of development are two new interdisciplinary areas, namely biomedical engineering and oceanographic engineering. The program includes opportunities for advanced experimental work as well as theoretical study. Special emphasis is offered in the particular areas of heat and mass transfer, thermodynamics, high-speed transportation, hydrodynamics, compressible flow, vibrations, system response and control, refrigeration and cryogenics, nuclear engineering, mechanical design, and the science of materials. Increasing emphasis is placed on developing the creative abilities of graduate students and on relating the work to the evolving needs of modern engineering practice.

Professors

Jack Bartley Chaddock, Sc.D. (Massachusetts Institute of Technology), Chairman and Director of Graduate Studies; Van Leslie Kenyon, Jr., M.M.E. (Delaware); L. Sigfred Linderoth. M.E. (Iowa State University); John Nelson Macduff, M.M.E. (New York University); James Lathrop Meriam, Ph.D. (Yale); George Wilbur Pearsall, Sc.D. (Massachusetts Institute of Technology).

Associate Professors

Ernest Elsevier, M.S. in M.E. (Georgia Institute of Technology); Charles Morgan Harman, Ph.D. (Wisconsin).

Assistant Professor

Gale Herbert Buzzard, Ph.D. (North Carolina State).

Courses of Instruction

ME 201. Introduction to Advanced Mechanics

ME 202. Theoretical Thermodynamics ME 221. Compressible Fluid Flow

ME 222. Heat Transfer

ME 231, 232. Systems Engineering ME 265. Advanced Topics in Mechanical Engineering

ME 280. Nuclear Reactor Power Cycles

ME 297, 298. Thesis Research

English

The department offers graduate work leading to the A.M., M.A.T., and Ph.D. degrees. A statement of the requirements for the Ph.D. degree may be obtained from the Director of Graduate Studies.

Professors

Benjamin Boyce, Ph.D. (Harvard), Acting Director of Graduate Studies; Louis J. Budd, Ph.D. (Wisconsin); Bernard I. Duffey, Ph.D. (Ohio State); Norman Eliason, Ph.D. (Johns Hopkins), Visiting Professor; Simeon K. Heninger, B.Litt. (Oxon.), Ph.D. (Johns Hopkins); John L. Livesay, Ph.D. (Washington); Clarence Gohdes, Ph.D. (Cohumbia), James B. Duke Professor of English; Holger O. V. Nygard, Ph.D. (California), Director of Graduate Studies;

Lewis Patton, Ph.D. (Yale); Edmund Reiss, Ph.D. (Harvard); Charles Richard Sanders, Ph.D. (Chicago); Grover C. Smith, Ph.D. (Columbia); Lionel Stevenson, B.Litt. (Oxon.), Ph.D. (California), F.R.S.L., James B. Duke Professor of English, Chairman; Arlin Turner, Ph.D. (Texas); Robert van Kluyve, Ph.D. (Johns Hopkins); Charles Eugene Ward, Ph.D. (Duke).

Associate Professors

Oliver W. Ferguson, *Ph.D.* (*Illinois*); Dale B. J. Randall, *Ph.D.* (*Pennsylvania*); George W. Williams, *Ph.D.* (*Virginia*).

Courses of Instruction

203. Chaucer

207. Old English Grammar and Readings

208. History of the English Language

209. Present-Day English

213. Introduction to Folklore (Not 1967-68)

215, 216. Tudor and Stuart Drama, 1500-1642

217. Milton

218. Spenser

219, 220. The Eighteenth Century

221, 222. English Literature of the Early Nineteenth Century

223, 224. English Literature of the Later Nineteenth Century

227. Literary Criticism (Not 1967-68) 229, 230. American Literature, 1800-

1865 233, 234. American Literature, 1865-

235, 236. American Literature since

237. English Drama, 1642-1800 (Not 1967-68)

239. Shakespeare

244. Literary Biography

251, 252. English Literature of the Seventeenth Century

261, 262. English Literature of the Twentieth Century

264. Major Developments in Contemporary American Poetry (Not 1967-68)

266. Recent Critical Thought

269, 270. Southern Literature

277. English Prose of the Sixteenth Century (Not 1967-68)

278. English Non-dramatic Poetry of the Sixteenth Century

304. Studies in the Metaphysical Poets

306. Studies in Chaucer

311. Beowulf

313. The Traditional Ballad and Folksong

315. Middle English Literature (Not 1967-68)

320. Medieval Romances (Not 1967-68)

322. Genre Studies in Twentieth Century American Literature

330. Textual Criticism (Not 1967-68)

331. Emerson

332. Whitman (Not 1967-68)

333. Hawthorne and Melville

334. Studies in the Critical and Philosophical Ideas of Coleridge and Carlyle

338. Studies in American Realistic Fiction (Not 1967-68)

339. Studies in Shakespeare

340. Studies in Renaissance English Prose (Not 1967-68)

342. Studies in Dryden and his Age (Not 1967-68)

345. The Eighteenth-Century Novel

346. Studies in Swift (Not 1967-68) 347. Studies in Victorian Poetry (Not

1967-68)

348 Studies in Victorian Fiction

348. Studies in Victorian Fiction (Not 1967-68)

363. Studies in British Poetry of the Twentieth Century

374. Studies in American Humor

378. Samuel Johnson's Literary Criticism and Related Topics

100. English for Foreign Students

Forestry

Major and minor work is offered in the natural and social scientific aspects of forestry leading to the Master of Arts and Doctor of Philosophy degrees. Work for these degrees may be pursued in forest-tree physiology, wood anatomy and properties, forest pathology, silvics, forest soils, forest mensuration and biometry, forest entomology, forest economics, and forest climatology and hydrology. College graduates who have had specialized training in pro-

fessional forestry or the related basic areas of the natural or social sciences may be considered for admission. Students without previous forestry training are ordinarily restricted to the particular fields (listed above) for which their academic background qualifies them. For information on professional training in forestry see *Bulletin of the School of Forestry*.

Professors

Roger Fabian Anderson, *Ph.D.* (*Minnesota*); Robert Lloyd Barnes, *Ph.D.* (*Duke*); Donald J. Fluke, *Ph.D.* (*Yale*); Ellwood Scott Harrar, *Ph.D.*, *Sc.D.* (*Syracuse*), *Chairman*; Paul Jackson Kramer, *Ph.D.* (*Ohio State*), *James B. Duke Professor of Botany*; Aubrey Willard Naylor, *Ph.D.* (*Chicago*); James Granville Osborne, *B.S.* (*University of California*): Charles William Ralston, *Ph.D.* (*Duke*); James G. Yoho, *Ph.D.* (*Michigan State*), *Director of Graduate Studies*.

Associate Professors

Kenneth Richard Knoerr. Ph.D. (Yale); William James Stambaugh, Ph.D. (Yale); John Dennis Sullivan, Ph.D. (Michigan State); Frank Wilson Woods, Ph.D. (Tennessee).

Assistant Professor

Melvin O. Braaten, Ph.D. (North Carolina State).

Courses of Instruction

203. Forest Meteorology223. Forest Pathology

230. Forest Entomology

243. Silvics

251. Sampling Methods in Forestry*

257. Design of Forestry Experiments and Analysis of Data*

261. Forest Soils

270. Economics of Forestry

276. Forestry Policy290. Wood Anatomy

295. Surface Generation in Wood

296. Chemistry of Wood

297. Wood Physics (Mechanics) 301, 302. Advanced Studies in Forestry

321. Research Techniques in Forest Pathology

331. Toxology of Insecticides

332. Ecology of Forest Insects

333. Morphology and Taxonomy of Forest Insects

342. Forest Hydrology

344. Micrometeorology

347, 348. Seminar in Silvics

352. Analysis of Forest Measurements 353. Sampling and Experimental Design

in Forestry

357, 358. Research in Forestry

362. Forest Soil Physics 366. Forest Soil Fertility

368. Field Seminars

378. Seminar in Forest Economics 379. Economic Analysis in Forestry

390. Wood-Liquid Surface Interactions

391. Seminar in Wood Science and Forest Products

392. Advanced Wood Physics

Geology

The Department of Geology offers graduate work leading to the A.M. degree. An undergraduate degree in geology is not a prerequisite for graduate studies, but a student must have had or must take introductory courses in field geology, mineralogy, sedimentary rocks, stratigraphy, paleontology, and structural geology. In addition he must have had one year of college chemistry, one year of college physics, and mathematics through calculus.

Graduate courses in the Department of Geology are designed to provide training in the field of environmental sedimentary geology with specialized training in bio-environments, litho-environments, and modern environments.

Minor work is available in the fields of zoology, physics, mathematics, chemistry, or approved courses offered in the Department of Geology at the University of North Carolina at Chapel Hill.

An acceptable thesis is required for the A.M. degree.

Associate Professor

S. Duncan Heron, Jr., Ph.D. (North Carolina), Acting Chairman and Director of Graduate Studies.

Assistant Professors

George W. Lynts, Ph.D. (Wisconsin); Orrin H. Pilkey, Ph.D. (Florida State).

Courses of Instruction

203. Advanced Stratigraphy
205. Geological Oceanography
(Beaufort)
206. Principles of Geological
Oceanography

207. Sedimentary Petrography 222. Sedimentary Minerals

235. Sedimentary Geochemistry

241-242. Invertebrate Paleontology

243-244. Micropaleontology

247. Paleoecology251. Geomathematics

305. Physical Environments Seminar

306. Bio-environments Seminar

340. Paleontology Seminar

371, 372. Advanced Topics in Geology

Germanic Languages and Literature

The Department of Germanic Languages and Literature offers graduate work leading to the A.M. degree. Students who expect a major in German should have had sufficient undergraduate courses in Germanic languages to enable them to proceed to more advanced work.

Students who wish to take courses in German for a minor should normally have completed a third-year course (in exceptional cases, a second-year) of college German with acceptable grades.

Professors

Herman Salinger, Ph.D. (Yale), Chairman, Director of Graduate Studies; Leland R. Phelps, Ph.D. (Ohio State).

Visiting Lecturer

Alois Arnoldner, Ph.D. (Vienna).

Associate Professor

Richard K. Seymour, Ph.D. (Pennsylvania).

Assistant Professors

Thomas W. Best, Ph.D. (Indiana); George Salamon, Ph.D. (Harvard).

Courses of Instruction

201, 202. Goethe

203, 204. Eighteenth Century (Not 1967-68)

205, 206. Middle High German*

207, 208. German Romanticism*

209, 210. Kleist, Grillparzer, and Hebbel*

211, 212. Heinrich Heine*

213. Nineteenth-Century Literature (1967-68)

214. The Twentieth Century (1967-68)

215. Seventeenth-Century Literature (Not 1967-68)

216. History of the German Language (1967-68)

217. Renaissance and Reformation Literature (1967-68)

218. The Teaching of German (1967-68)

230. German Cultural History*

232. Bibliography and Methods*

233. Advanced Composition*

316. The Austrian Novel*

——. Graduate Reading Course (1967-68)

History

The Department of History offers graduate work leading to the M.A. and Ph.D. degrees. A candidate for the degree of Doctor of Philosophy is

required to prepare himself for examination in four fields, of which three shall normally be within history and of which one must be in American history or in the history of Western Europe. The choice and delimitation of fields is determined in consultation with his supervisor and the Director of Graduate Studies. The Department offers graduate instruction in Ancient History; Medieval Europe; Modern Europe; American History; England and the Commonwealth; Russia; Latin America; the Far East in the modern period; South Asia in the modern period: military history: and historiography.

Students may receive credit for either semester of a hyphenated course without taking the other semester if they obtain written permission from the

instructor and the Director of Graduate Studies.

Professors

John Richard Alden, Ph.D. (Michigan); Joel Colton, Ph.D. (Columbia). Chairman; Robert Crane, Ph.D. (Yale); John Shelton Curtiss, Ph.D. (Cohunbia); Robert Durden, Ph.D. (Princeton), Director of Graduate Studies; Arthur Bowles Ferguson, *Ph.D.* (*Cornell*); William Baskerville Hamilton, *Ph.D.* (*Duke*); Irving B. Holley, Jr., *Ph.D.* (*Yale*); John Tate Lanning, *Ph.D.* (*Cali*fornia); Alan Krebs Manchester, Ph.D. (Duke); Harold Talbot Parker, Ph.D. (Chicago); Richard Arthur Preston, Ph.D. (Yale); Theodore Ropp, Ph.D. (Harvard); Richard L. Watson, Jr., Ph.D. (Yale); Robert Hilliard Woody, Ph.D. (Duke).

Associate Professors

Frances Dorothy Acomb, Ph.D. (Chicago); Calvin DeArmond Davis, Ph.D. (Indiana); Donald Gillin. Ph.D. (Stanford); Frederic B. M. Hollyday, Ph.D. (Duke); Warren Lerner, Ph.D. (Columbia): Anne Firor Scott, Ph.D. (Radcliffe); William Evans Scott, Ph.D. (Yale); Bernard S. Silberman, Ph.D. (Michigan); Charles Young, Ph.D. (Cornell).

Assistant Professor

Donald E. Ginter, Ph.D. (California).

Courses of Instruction

201-202. The History of Russia, 1801-1917

203-204. The United States, 1850-1900 205-206. The United States in the

Twentieth Century

209-210. Constitutional History of the United States, 1760 to the Present (Not 1967-68)

212. Recent Interpretations of United States History

213-214. The Old South

215-216. Diplomatic History of the United States

217, 218. Europe Since 1870.

221-222. The Age of the Renaissance 223-224. The Old Regime and the

French Revolution, 1661-1815

225, 226. The Age of the Reformation 227. 228. Europe in the Nineteenth Century

229. Recent Interpretations of Modern European History

231-232. The Hispanic Colonies and Republics in America

233-234. The Institutional, Cultural,

and Social History of Hispanic America

235, 236. European Expansion Overseas 237-238. Europe in the Middle Ages

241-242. Nationalism and Communism in the Far East

245-246. War in the Modern World

247, 248. The History of Modern India and Pakistan, 1757-1947

249-250. Social and Intellectual History of the United States

251-252. Recent European History

257. Social and Cultural History of the Hellenistic World from Alexander to

258. Social and Cultural History of the Graeco-Roman World

259-260. The Emergence of the New South, 1865 to the Present

261-262. Problems in Soviet History

263-264. American Colonial History and the Revolution, 1607-1789

265-266. Modern South America

267, 268. From Medieval to Modern England

269. British History, 1688-1867270. British History from Mid-Nineteenth Century

271-272. England, 1660-1832 275-276. Central Europe, 1849-1914

285. Origins of Indian Civilization

287-288. History of Modern Japan 297. The British Empire from American Revolution to the Boer War

298. The Commonwealth in the Twentieth Century

303-304. The United States in the Twentieth Century

305-306. Seminar—British History 307-308. Seminar—United States History

309-310. Seminar—American Colonial and Revolutionary History

315-316. Seminar—Southern History

317-318. Seminar—History of Western Europe

321-322. Seminar—History of Spain, Hispanic American, and Inter-American Relations

337-338. Seminar—Medieval History

343-344. Seminar—History of American Foreign Relations

347-348. Seminar on Recent India

353-354. Seminar on the Second British Empire and the Commonwealth of Nations

361-362. Seminar in the History of Russia

401. Seminar on the British Commonwealth

312. Seminar—The Teaching of History in College

320. Historiography

Hospital Administration

A program leading to the M.H.A. degree provides preparation for a career of administration in hospitals and other health agencies to specially selected graduate students. Admission to this program is limited to 16 students a year, and selection is based upon suitability for the practice of management as well as capability for graduate study. This program normally requires 24 months to complete, as it includes a 12-month administrative residency under faculty supervision in hospitals and related institutions as well as an academic program of 36 graduate units, of which 18 are in Hospital Administration and 18 in designated courses in Economics, Political Science, and Sociology.

Professors

Ray E. Brown, M.B.A. (Chicago); Charles H. Frenzel, A.B. (Duke).

Associate Professor

Louis E. Swanson, A.B. (Hamline).

Assistant Professor

Donald S. Smith, II, M.H.A. (Minnesota).

Courses of Instruction

201. History and Development of Hospitals and Other Health Agencies 203-204. Principles of Organization and Management of Hospitals and Other Health Agencies 211-212. Seminars in Health Administration

215. Administrative Residency

Mathematics

Graduate work in the Department of Mathematics is offered leading to the A.M. and Ph.D. degrees. The student, in his undergraduate work, must have had courses in differential and integral calculus, and at least 6 semester hours of other courses in mathematics on the junior or senior level.

The A.M. degree with a major in mathematics is awarded primarily on the basis of scholarship. Of the 24 units of course work required for this degree, 18 units must be taken in the Department of Mathematics. Since a reading knowledge of French. German, and Russian is highly desirable for the student of mathematics, he should satisfy the language requirements in two of these languages as early as possible.

Professors

Leonard Carlitz, Ph.D. (Pennsylvania); Francis George Dressel, Ph.D. (Duke); William Whitfield Elliott, Ph.D. (Cornell); John Jay Gergen, Ph.D. (Rice); Francis Joseph Murray, Ph.D. (Columbia); John Henderson Roberts, Ph.D. (Texas), Acting Chairman; Joseph Robert Shoenfield, Ph.D. (Michigan); Seth L. Warner, Ph.D. (Harvard), Director of Graduate Studies; Max Adkin Woodbury, Ph.D. (Michigan).

Associate Professors

Jacob Burlak, Ph.D. (Cambridge); Thomas Muir Gallie, Jr., Ph.D. (Rice); Thomas Davies Reynolds, Ph.D. (Duke); George Trevor Williams, Sc.D. (Johns Hopkins).

Assistant Professors

Marion Ritchie Bryson, Ph.D. (Iowa State); Donald Smiley Burdick, Ph.D. (Princeton); Lowell Arthur Hinrichs, Ph.D. (Oregon); Richard Earl Hodel, Ph.D. (Duke); Joseph Weston Kitchen, Jr., Ph.D. (Harvard); Merrell Lee Patrick, Ph.D. (Carnegie Tech.); Richard Arthur Scoville, Ph.D. (Yale); Ram Prasad Srivastav, Ph.D. (Glasgow); David Alexander Smith, Ph.D. (Yale). Olaf Patrick Stackelberg, Ph.D. (Minnesota).

Adjunct Professor

Walter Edwin Sewell, Ph.D. (Harvard).

Courses of Instruction

204. Geometry for Teachers

217-218. Intermediate Analysis

221-222. Numerical Analysis

227-228. Theory of Numbers (Not 1967-68)

229-230. Algebraic Numbers (Not 1967-68)

233. Statistical Methods

234. Sample Designs

235-236. Abstract Algebra

244. Design of Experiments

245-246. Combinatorial Analysis (1967-68)

247-248. Arithmetic of Polynomials (Not 1967-68)

262. Non-parametric Statistics

271-272. Introductory Topology

273-274. Algebraic Topology*

283. Applied Mathematical Statistics284. Least Squares Analysis of Linear

285-286. Applied Mathematical Methods

287-288. Foundations of Mathematics

(listed also as Philosophy 287-288) (Not 1967-68)

289-290. Applications of Stochastic Processes I, II

291-292. Analysis I, II

303. Advanced Theory of Numbers (Not 1967-68)

322. Biomathematics (listed also as Physiology M322)

325-326. Analysis III, IV

327-328. Partial Differential Equations*

329-330. Theory of Distributions*

333-334. Analytic Theory of Numbers (Not 1967-68)

335-336. Topics in Algebra (1967-68)

343-344. Ordinary Differential Equations*

371-372. Dimension Theory (1967-68)

383-384. Lie Groups and Algebras

(Not 1967-68)

395-396. Topological Algebra (1967-68)

397-398. Seminar in Algebra and Number Theory

Microbiology and Immunology

Prerequisites for admission in full include undergraduate training in the physical as well as biological sciences and minimally include general physics, calculus, organic chemistry, and physical chemistry. Provisional admission is

granted to those who agree to make up deficiencies at Duke. GRE scores in verbal, quantitative, and advanced examinations weigh heavily in determining awardees of fellowships. Fellowships in the form of NIH traineeships are available for full-time study in microbiology and in immunology. A candidate for the Doctor of Philosophy degree in Microbiology must pass both written and preliminary examinations. These are given after the language requirements have been filled and the student has earned 60 semester hours of credit. A brochure describing the Doctor of Philosophy program and research in the Department can be obtained by writing the Director of Graduate Studies.

Professors

D. Bernard Amos, M.D., (Guys Hospital, London); Joseph Willis Beard, M.D. (Vanderbilt); Norman Francis Conant, Ph.D. (Harvard), James B. Duke Professor of Microbiology, Chairman; Eugene D. Day, Ph.D. (Delaware), Director of Graduate Studies; John E. Larsh, Jr., Sc.D. (Johns Hopkins); Ralph Wayne Rundles, M.D., Ph.D. (Cornell); David Tillerson Smith, M.D. (Johns Hopkins), Litt.D., James B. Duke Professor of Bacteriology; Hilda Pope Willett, Ph.D. (Duke).

Associate Professors

Richard S. Metzgar, *Ph.D.* (*Buffalo*); Suydam Osterhout, *M.D.*, *Ph.D.* (*Rockefeller Institute*); Robert W. Wheat, *Ph.D.* (*Washington*); Chester M. Zmijewski, *Ph.D.* (*Buffalo*).

Assistant Professors

Richard O. Burns, Ph.D. (Illinois); John F. Flanagan, M.D. (Duke).

Courses of Instruction

201. Advanced Microbiology

M211. Hematology

M221. Medical Microbiology

231. Fundamentals of Immunology

M291. Medical Parasitology

310. Microbial Physiology

312. Tissue Immunology

313. Immunohematology

314. Immunochemistry

316. Immunogenetics

323. Readings in Bacteriology and Immunology

324. Research Seminar on Viruses

325. Medical Mycology

326-327. Microbiology Seminar

328. Immunology Seminar

Pathology

The graduate program in pathology is intended to prepare well-qualified individuals for a career in academic and experimental pathology and give them a sound understanding of the structural and chemical processes which are involved in disease. The study of pathology brings together structure and function into one discipline by utilizing modern chemical, biologic, and ultra-structural techniques.

Professors

Donald B. Hackel, M.D. (Harvard); Nathan Kaufman, M.D. (McGill), Director of Graduate Studies; Thomas D. Kinney, M.D. (Duke), Chairman; Jacinto J. Vazquez, M.D. (Univ. of Havana); F. Stephen Vogel, M.D. (Western Reserve).

Associate Professors

Bernard F. Fetter, M.D. (Duke); Joachim R. Sommer, M.D. (Munich); Benjamin F. Trump, M.D. (Kansas); Benjamin Wittels, M.D. (Minnesota).

Assistant Professors

Jane G. Elchlepp, Ph.D. (Iowa), M.D. (Chicago); Harvey Sage, Ph.D. (Yale).

Courses of Instruction

M350. Human Pathology M351. Correlative Pathology

M352. Basic Problems in Chemical Pathology

M353. Advanced Neuropathology

M354. Immunopathology

M355, M356. Seminar in Pathology

M357. Research in Pathology
M358. Cellular Ultrastructure in Pathology
M359. Applied Instrumentation to the Field of Ultrastructural Pathology
M360. Enzymatic and Determinative

Histochemistry

Philosophy

The Department of Philosophy offers graduate work leading to the A.M. and Ph.D. degrees. Tutorial work complements formal instruction. Students may specialize in any of the following fields: the History of Philosophy; Logic; Philosophy of Science; Epistemology; Metaphysics; Philosophical Analysis; Ethics; Aesthetics; Political Philosophy; and Philosophy of Law. Applicants for admission must offer scores of the Graduate Record Examination or the Miller Analogies Test.

Individual programs of study are developed for each student. The following requirements, however, are fundamental: (1) In February of their first year new graduate students are required to take two qualifying examinations to determine the student's fitness to continue in graduate work. One examination is in the history of philosophy, ancient and modern: the other is on some central philosophical topic, treated systematically. In addition the student will take the logic preliminary examination. (2) The remaining preliminary examinations for the Ph.D.—which may be taken only after the student has met the language requirements for that degree—should be taken during the first year of study beyond the A.M. degree or at the end of the second year of graduate work. In these examinations students are expected to combine historical knowledge with critical understanding.

Work in a minor field outside of the Department, but not necessarily confined to any one department, must include six units for the A.M. or the Ph.D. and may include more as a student's program requires or permits.

Professors

Charles A. Baylis, Ph.D. (Harvard), Chairman; Romane Lewis Clark, Ph.D. (State Univ. of Iowa): Glenn Robert Negley, Ph.D. (Chicago); William Bernard Peach, Ph.D. (Harvard); Paul Welsh, Ph.D. (Cornell), Director of Graduate Studies; Neil Leslie Wilson, Ph.D. (Yale).

Assistant Professors

Marshall Spector, Ph.D. (Johns Hopkins); Edward P. Mahoney, Ph.D. (Columbia).

Courses of Instruction

- 202. Aesthetics
- 203. Contemporary Ethical Theories
- 205. Philosophy of History
- 208. Political Values
- 211. Plato
- 217. Aristotle
- 219. Kant
- 225. British Empiricism
- 227. Continental Rationalism
- 228. Recent and Contemporary Philosophy
- 229. American Pragmatism

- 230. The Meaning of Religious Language (also listed as Religion 230)
 - 233. Introduction to the Philosophy of
 - 234. Philosophy of Science (Not 1967-
- 235. Philosophy and the Sciences (1967-68)
- 241. Logic*
- 246. General Semantics and Theory of Language*
- 247. Philosophical Cosmology

250. Philosophical Anaylsis

252. Metaphysics

287-288. Foundations of Mathematics (also listed as Mathematics 287-288)

291, 292. Critical Philosophy

331, 332. Seminar in Special Fields of Philosophy

Physics

The Department of Physics offers graduate work leading to the A.M. and Ph.D. degrees. Course work is designed to give a broad basic foundation in classical and modern physics. All graduate students will be expected to acquire a thorough knowledge of the various branches of classical physics and some familiarity with modern physics and with basic laboratory skills. They will be required to take such course work in the 200-number courses as may be necessary to obtain this foundation.

The student will be required to take such course work as will best be adapted to the kind of work he will subsequently specialize in and to the kind of research he will undertake. The choice of minor will be similarly determined.

Since a practical reading knowledge of French and German is highly desirable for the student of physics, he should satisfy these language requirements as early as possible.

Professors

L. C. Biedenharn, Jr., Ph.D. (Massachusetts Institute of Technology); Henry A. Fairbank, Ph.D. (Yale); Michael Danos, Ph.D. (Heidelberg), Chairman; Earle C. Fowler, Ph.D. (Harvard); Walter Gordy, Ph.D. (North Carolina), LL.D., D.H.C., James B. Duke Professor of Physics; Eugene Greuling, Ph.D. (Indiana), Director of Graduate Studies; Harold W. Lewis, Ph.D. (Duke); Horst Meyer, D.Sc. (Geneva); Henry W. Newson, Ph.D. (Chicago); Hermann Robl, Ph.D. (Vienna), Adjunct Professor.

Associate Professors

Edward G. Bilpuch, Ph.D. (North Carolina); Hugh G. Robinson, Ph.D. (Duke).

Assistant Professors

William P. Beres, Ph.D. (Massachusetts Institute of Technology); Dwight W. Carpenter, Ph.D. (Illinois); Lawrence E. Evans, Ph.D. (Johns Hopkins); Lloyd Fortney, Ph.D. (Wisconsin); Robert A. Guyer, Ph.D. (Cornell); Max G. Huber, Ph.D. (Freiburg); Earle R. Hunt, Ph.D. (Rutgers); Russell Roberson, Ph.D. (Johns Hopkins); Richard L. Walter, Ph.D. (Notre Dame).

Instructors

R. L. Cook, Ph.D. (Notre Dame); Wayne J. Hollman, III, Ph.D. (Massachusetts Institute of Technology).

Course of Instruction

201-202. Mechanics

215. Introduction to Quantum Mechanics

217-218. Advanced Physics Laboratory

220. Advanced Electronics

221-222. Theoretical Physics

223. Electricity and Magnetism

303. Thermodynamics

304. Statistical Mechanics*

305. Introduction to Nuclear Physics

306. Low Temperature Physics

308. Introduction to High Energy

Physics

309. Solid State

310. Advanced Solid State*

316. Principles of Quantum Theory

317. Intermediate Quantum Theory

318-319. Electromagnetic Field Theory

331. Microwave Radiation

335. Microwave Spectroscopy

341. Advanced Topics in Quantum Theory*

342. Theory of Elementary Particle*

343. Nuclear Physics*

344. Advanced Nuclear Physics*

345. High Energy Physics

346. Topics in Theoretical Physics*

351-352. Seminar

Physiology and Pharmacology

Professors

Frederick Bernheim, Ph. D. (Cambridge); J. J. Blum, Ph.D. (Chicago); R. Bressler, M.D. (Duke); P. Horowicz, Ph.D. (Johns Hopkins); J. L. Kostyo, Ph.D. (Cornell), Director of Graduate Studies; John W. Moore, Ph.D. (Virginia); Eugene M. Renkin, Ph.D. (Harvard); D. C. Tosteson, M.D. (Harvard), Chairman.

Associate Professors

Peter J. Bentley, Ph.D. (Western Australia); E. A. Johnson, M.D. (Sheffield); F. F. Jöbsis, Ph.D. (Michigan); E. Croft Long, Ph.D. (London); Athos Ottolenghi, M.D. (Pavia, Italy); John V. Salzano, Ph.D. (Iowa); G. G. Somjen, M.D. (New Zealand).

Assistant Professors

P. E. Hochstein, Ph.D. (Maryland); Leon Lack, Ph.D. (Columbia); T. J. McManus, M.D. (Boston University); T. Narahashi, Ph.D. (University of Tokyo).

Courses of Instruction

M204. Topics in Muscle Physiology

M205. Physiological Models

M260. Ceilular Aspects of Drug Action

M261. Introductory Physiology

M271. Foundations of Contemporary Physiology

M272. Foundations of Contemporary

Pharmacology M279. Student Seminar in Physiology

and Pharmacology

M281. Physiological Instrumentation M322. Biomathematics

M367. Physiology of Cell Growth and Development

M368. Cardiac Physiology and

Pharmacology

M369. Pharmacology Mode of Action of Drugs

M370. Seminar

M371. Topics in Pulmonary and Cardiovascular Physiology

M372. Research

M373. Cellular Endocrinology

M374. Cellular Neurophysiology

M376. Cellular Metabolism and Energetics

M377. Cellular Transport Processes

M378. Reproduction

M379. Physiology of the Central Nervous System

Political Science

The Department of Political Science offers graduate work leading to the A.M. and Ph.D. degrees. Before being admitted to candidacy for the Ph.D. degree, an applicant is normally expected to have qualified for the A.M. degree.

Instruction is designed to prepare the student for teaching and research, for government service, and for other work related to public affairs. Before undertaking graduate study in political science, a student is ordinarily expected to have completed at least 12 semester hours of course work in political science, including some work in American government.

Fields of political science in which instruction is at present offered for candidates for the degree of Doctor of Philosophy are the following: American Government and Constitutional Law; Comparative Government and Politics (with special reference to Western Europe, Southern Asia, the Soviet Union, or the Commonwealth); Political Theory; American State and Local Government; International Law and Relations; Public Administration; Political Parties and Voting Behavior. Candidates for the degree of Doctor of Philosophy in political science must elect five fields, including Comparative Government and Political Theory; at least one of the five fields must be taken in a department other than the Department of Political Science.

Professors

M. Margaret Ball, Ph.D (Stauford); Ralph Braibanti, Ph.D. (Sycracuse); Robert Taylor Cole, Ph.D. (Harvard), Janues B. Duke Professor of Political Science; John Hamilton Hallowell, Ph.D. (Princeton), Chairmau; Wladyslaw W. Kulski, Dr.jur. (Paris), Janues B. Duke Professor of Russiau Affairs; Richard Heald Leach, Ph.D. (Princeton); Jesse Harris Proctor, Jr., Ph.D. (Harvard), Director of Graduate Studies; Robert Stanley Rankin, Ph.D. (Princeton); Robert Renbert Wilson, Ph.D. (Harvard), Janues B. Duke Professor of Political Science.

Associate Professors

Hugh Marshall Hall, Jr., Ph.D. (Texas); J. Woodford Howard, Ph.D. (Princeton).

Assistant Professor

Allan Kornberg, Ph.D. (Michigan).

Courses of Instruction

207. American Constitutional Law and Theory

208. American Constitutional Law and Current National Problems

209. Problems in State and Local Government in the United States

220. Problems in International Politics221. International Public Organization

222. Empirical Theory and Methodology

223. Political Philosophy from Plato to Machiavelli

224. Modern Political Theory

225. Comparative Government and Politics—Western Europe

227-228. International Law

229. Recent and Contemporary Political Theory

230. American Political Institutions

231. American Political Theory*

234. Civil-Military Relationships in American Government*

235. The British Commonwealth

241. Administrative Management

242. National Administration

244. Administrative Law and Process

246. Government Administration and Public Policy*

249. Comparative Political Analysis and Political Development

250. Comparative Government and Politics—Southern Asia I

251. Comparative Government and Politics—Southern Asia II

275. The National Party System

276. Comparative State Parties and Politics

280. Comparative Government and Politics—Sub-Saharan Africa

285. The Judicial Process

291. Problems of Urban Government

292. Urban Administration*

301-302. Departmental Graduate Seminar

310. Seminar—State Government

312. Seminar—Constitutional Law

321. Seminar—Political Theory

325. Seminar—Comparative Government and Politics—Western Europe328. Seminar—International Law

330. Seminar—Comparative Govern-

ment and Politics—Southern Asia
341. Seminar—Public Administration*

360. Seminar—Government and Politics

in the Soviet Union

361. Seminar—Foreign Relations of the Soviet Union

376. Seminar—Political Behavior

401. Seminar—The British Commonwealth

410. Seminar—Government, History, and Social Structure of India and Pakistan*

Psychology

The Department offers work leading to the A.M. and Ph.D. degrees. For the Ph.D. degree the areas of concentration are: theoretical-experimental psychology; biological and comparative psychology; social psychology; and personality-clinical psychology. All fields of specialization presuppose thorough preparation in the general methods, data, and theories of psychology. Programs of study are typically arranged to provide this common background in the first year or two, with increasing specialization in course work and research in subsequent years. Early in the second year of residence, the Ph.D. student

is expected to have planned his further program of specialized studies; by the end of the second year, when the preliminary is normally taken, the doctoral dissertation plan should be formulated. An original dissertation demonstrating independent research competence and scholarship is the most important formal requirement for the Ph.D. degree.

Students specializing in clinical psychology undertake field work in a variety of settings, and an integral part of this program is a one-year internship in an approved and appropriate institution. Clinical internship is arranged for the third year of study or a later year, depending on the student's progress and needs.

Minor work in a variety of fields is available, but the areas most relevant to graduate work in psychology are the biological sciences (zoology, neuro-anatomy, physiology), mathematics and statistics, sociology and anthropology, and philosophy of science. Basic course work in statistics is taken in the Department of Mathematics (see Mathematics 233 and 244).

Further details concerning the program of studies in psychology may be

obtained from the Director of Graduate Studies in Psychology.

Professors

Donald Keith Adams, Ph.D. (Yale); Irving Emanuel Alexander, Ph.D. (Princeton), Chairman; Jack Williams Brehm, Ph.D. (Minnesota); Bingham Dai, Ph.D. (Chicago); Irving Thomas Diamond, Ph.D. (Chicago); Norman Guttman, Ph.D. (Indiana), Director of Graduate Studies; Edward Ellsworth Jones, Ph.D. (Harvard); Gregory Adams Kimble, Ph.D. (Iowa); Michael Arthur Wallach, Ph.D. (Harvard).

Associate Professors

John Cooley Altrocchi, *Ph.D.* (*California*); Katharine May Banham. *Ph.D.* (*Montreal*); Lloyd Joseph Borstelmann, *Ph.D.* (*California*); Robert Charles Carson, *Ph.D.* (*Northwestern*); Robert Porter Erickson, *Ph.D.* (*Brown*); Martin Lakin, *Ph.D.* (*Chicago*); Harold Schiffman, *Ph.D.* (*Princeton*); Cliff Waldron Wing, Jr., *Ph.D.* (*Tulane*).

Associate Research Professor

Mercedes Gaffron, M.D. (Munich), Ph.D. (Berlin).

Assistant Professors

Carl John Erickson, *Ph.D.* (*Rutgers*); Irwin Kremen. *Ph.D.* (*Harvard*); Darwyn Ellsworth Linder, *Ph.D.* (*Minnesota*); Gregory Roger Lockhead, *Ph.D.* (*Johns Hopkins*); David Lin Singer, *Ph.D.* (*Yale*).

Lecturers

Jack Botwinik, Ph.D. (New York); Sanford Irwin Cohen, M.D. (Chicago); Elaine Kobrin Crovitz, Ph.D. (Duke); Herbert Floyd Crovitz, Ph.D. (Duke); Carl Eisdorfer, Ph.D. (New York), M.D. (Duke); Ben Wayne Feather, M.D., Ph.D. (Duke); Ila Gehman, Ed.D. (Pennsylvania State); Mary Martin Huse, Ph.D. (Duke); Arnold David Krugman, Ph.D. (Kentucky); Walter Dorn Obrist. Ph.D. (Northwestern); Talmadge Lee Peele, M.D. (Duke); Barry M. Shmavonian, Ph.D. (Washington); George Gustav Somjen, M.D. (New Zealand); Donald Stedman, Ph.D. (George Peabody); Larry Wolford Thompson, Ph.D. (Florida).

Courses of Instruction

- 203. Sensation and Perception
- 204. Comparative Psychology
- 205. Interpersonal Processes
- 213. Conditioning and Learning
- 214. Behavior and Learning Theory
- 215. Developmental Psychology
- 216. Biological Psychology
- 217. Research Methods in Social Psychology
- 218. Social Psychology
- 220. Physiological Bases of Behavior
- 234. Seminar in Personality

236. Theoretical Psychology

237. Functional Neurophysiology

238. The Electroencephalogram and Psychological Function

239. Behavioral Correlates of Brain Damage in Man

245. Personality Theory I246. Personality Theory II

247-248. Personality Assessment

249. Introduction to Exceptional Children (listed also as Education 249)

251. Personality and Person Perception

253, 254. Personality Development

271. Seminar-Selected Problems

273. Principles of Psychological Mea-

282. Introduction to Methods of Psycho-

292. History of Psychology

305. Psychopathology

306. Seminar—Developmental Psychol-

309. Seminar—Learning

310. Seminar-Perception

311. Seminar—Instrumental Behavior

313. Seminar—Concept of Reflex 316. Seminar—Social Psychology

318. Seminar-Social Influence

320. Seminar—Community Mental

324. Seminar—Behavioral Studies of the

335-336. Clinical Psychology Practicum 337. Seminar-Sensory Discrimination

341. Principles of Psychotherapy I

342. Principles of Psychotherapy II

343, 344. Advanced Seminar in Clinical Psychology*

371. Pre-School Behavior Problems*

Religion

The Department of Religion offers graduate work leading to the A.M. and Ph.D. degrees. Students may major in one of three fields: (1) Biblical Studies; (2) Historical Studies; and (3) Systematic and Contemporary Studies.

In addition to course work in these major fields, students will take such other courses in cognate fields as will contribute to the enrichment of their major studies. This minor requirement may be fulfilled either by work in a cognate department, such as Classical Studies, History, or Political Science, or by work in a cognate field within the Department of Religion other than the field of major concentration.

The program of doctoral studies presumes a grounding in religion such as is normally derived from the course content of theoretical subjects of a seminary curriculum. Candidates for admission to the doctoral program are favored, therefore, who hold a B.D. degree from an accredited seminary or who have had at least two years of seminary study beyond the B.A. degree. Students applying for graduate work in religion directly from an undergraduate program should have had a strong undergraduate major in religion, and will be accepted for the Ph.D. program only on the condition of satisfactory completion of the M.A. degree with the department.

Candidates for the Ph.D. degree must complete the language requirements in both French and German not later than the beginning of the second year of residence.

Professors

W. Waldo Beach, B.D., Ph.D. (Yale), Director of Graduate Studies; Kenneth Willis Clark, B.D., Ph.D. (Chicago); Robert Ellis Cushman, Ph.D. (Yale), William D. Davies, B.D., M.A., D.D. (Wales); Stuart C. Henry, B.D., Ph.D. (Duke); Creighton Lacy, B.D., Ph.D. (Yale); Ray C. Petry, Ph.D. (Chicago), LL.D. (Manchester), James B. Duke Professor of Church History; William H. Poteat, B.D., Ph.D. (Yale); James L. Price, B.D., Ph.D. (Cambridge): William Franklin Stinespring, Ph.D. (Yale).

Associate Professors

Frank Baker, B.D., Ph.D. (Nottingham); Egil Grislis, B.D., Ph.D. (Yale); Frederick L. Herzog, Ph.D. (Princeton); Hans J. Hillerbrand, Ph.D. (Erlangen); Thomas A. Langford, B.D., Ph.D. (Duke), Chairman; Robert Osborn, B.D., Ph.D. (Drew); D. Moody Smith, B.D., Ph.D. (Yale); Herbert Sullivan, Ph.D. (Chicago); Orval Wintermute, B.D., Ph.D. (Johns Hopkins).

Assistant Professor

Charles K. Robinson, B.D., Ph.D. (Duke).

Courses of Instruction

Field I. Biblical Studies

201-202. First Hebrew 207-208. Second Hebrew

209. Biblical Theology

226. Exegesis of the Greek New Testament I

227. Exegesis of the Greek New Testament II

228. The Theology of the Gospel and Epistles of John

301. The Theology of the Dead Sea Scrolls 302. Studies in the Intertestamental Literature

304. Aramaic

305. Third Hebrew

306. Language and Literature of the Dead Sea Scrolls

307. Syriac

309. History of the Ancient Near East

310. Old Testament Prophecy

318. Textual Criticism of the New Testament

340-341. Seminar in the New Testament

Field II. Historical Studies

234. The Theology of Thomas Aquinas 240. The Theology of Richard Hooker 250. The Reformation of the 16th Cen-

tury 251. The Age of the Counter-Reforma-

tion 252. Pietism, Deism, and Rationalism

260. Seminar: Wesley Studies

279. Religions of East Asia

280. The History of Religions285. Origins of Indian Civilization

296. Religion on the American Frontier

322. Nineteenth-Century European
Theology

331. The Social Message of the Early and Medieval Church

332. The Medieval Church

334. Church Reformers and Christian Unity

336. Christian Mysticism in the Middle Ages

337. The Theology of Martin Luther

338. The Theology of John Calvin

339. Left-Wing Movements of the Reformation

387. Christian Ethics and Social Philosophy

391. Historical Types of Christian Ethics I

392. Historical Types of Christian Ethics II

395. Christian Thought in Colonial America

396. Liberal Traditions in American Theology

Field III. Systematic and Contemporary Studies

210. British Theology

230. The Meaning of Religious Language (also listed as Philosophy 230)

231. Seminar in Christianity and Contemporary Thought

292. Christian Ethics and International Relations

300. Systematic Theology

303. The New Hermeneutic and the Concept of History

320. Hegel and Schmeiermacher

325. Philosophical Theology I326. Philosophical Theology II

328. Twentieth-Century European Theology

333. Marxist Ideology and Christian

380. Existentialist Thought

385. Religion in American Literature

386. Theological Trends in the World Church

389. Christian Ethics and Contemporary Culture

390. Current Problems in Christian Ethical Theory

394. Christianity and the State

397. Contemporary American Theology

398. Colloquium on the College and University Teaching of Religion

Romance Languages

The Department of Romance Languages offers graduate work leading to the A.M. and Ph.D. degrees. In order to undertake graduate study in this Department, the student should normally have credit for four years of college courses in the chosen language, or 18 semester hours beyond the conventional two units offered at entrance to college. In addition to this minimum requirement, the student should have had one semester of review in composition and grammar.

It is recommended that candidates for the A.M. degree take a second

Romance language as the minor subject.

A candidate for the Ph.D. degree will be required to take some training in Romance linguistics, the amount to be determined by the Department upon consideration of the student's preparation in the field, and a course in methods of literary scholarship.

Professors

Clifton Cherpack, Ph.D. (Johns Hopkins); Gifford Davis, Ph.D. (Harvard); Neal Dow, Ph.D. (Pennsylvania); John Morton Fein, Ph.D. (Harvard), Chairman; Wallace Fowlie, Ph.D. (Harvard); Richard Lionel Predmore, D.M.L. (Middlebury); Bruce W. Wardropper, Ph.D. (Pennsylvania).

Associate Professors

Thomas Howard Cordle, Ph.D. (Yale), Director of Graduate Studies; Richard Babson Grant, Ph.D. (Harvard); Javier Herrero, D.L. (Madrid); Alexander Hull, Ph.D. (Washington); Marcel Tétel, Ph.D. (Wisconsin); Patrick R. Vincent, Ph.D. (Johns Hopkins).

French

Courses of Instruction

209. Advanced Composition and Syntax

210. French Phonetics

213, 214. Seventeenth-Century French Literature (1967-68)

- 217. Mallarmé and Rimbaud (1967-68)
- 219. Old French (1967-68)
- 221, 222. The Nineteenth-Century French Novel (1967-68)
- 223. French Literary Criticism (Not 1967-68)
- 225, 226. From Renaissance to Baroque in French Literature of the Sixteenth Century (1967-68)

- 228. French Poetry of the Twentieth Century (Not 1967-68)
- 233. Contemporary French Theater (Not 1967-68)
- 234. Proust (Not 1967-68)
- 236. Baudelaire (1967-68)
- 241, 242. French Literature and Thought in the Age of Enlightenment (1967-68)
- 245, 246. French Literature of the Twentieth Century (1967-68)
- 311, 312. French Seminar
- ——. Graduate Reading Course

Spanish

Courses of Instruction

- 251. The Origins of the Spanish Novel (1967-68)
- 252. Spanish Lyric Poetry before 1700 (Not 1967-68)
- 253. The Origins of the Spanish Theatre (Not 1967-68)
- 255. Modern Latin-American Literature (Not 1967-68)
- 256. Contemporary Latin-American Literature (Not 1967-68)
- 258. Old Spanish (1967-68)
- 259. Spanish Phonetics (1967-68)
- 260. Advanced Composition and Syntax (Not 1967-68)
- 261. Nineteenth-Century Novel (Not 1967-68)

262. Romanticism in Spain (1967-68) 265. Gold Age Literature: Cervantes (1967-68)

266. Golden Age Literature: The Drama (Not 1967-68)

275. Contemporary Spanish Literature: Essays and Lyric Poetry (1967-68) 276. Contemporary Spanish Literature: The Novel (1967-68) 321, 322. Hispanic Seminar

Italian

Course of Instruction

288. The Renaissance (1967-68)

Romance Languages

Courses of Instruction

R.L. 211. Approaches to Romance Literature

R.L. 218. The Teaching of Romance Languages

R.L. 224. Romance Linguistics (1967-

Slavic Languages and Literatures

No graduate degree is now offered in Slavic Languages and Literatures. The following courses may serve in the minor programs of students in other departments.

Associate Professors

Bronislas de Leval Jezierski, Ph.D. (Harvard); Magnus J. Krynski, Ph.D. (Columbia).

Courses of Instruction

201, 202. The Novelists of Nineteenth-Century Russia

208. Soviet Literature and Culture

230. Chekhov Slavic 204. Polish Literature of the Twentieth Century

212. Pushkin

Sociology and Anthropology

The Department offers graduate work leading to the A.M. and Ph.D. degrees in Sociology and in Anthropology. Before undertaking advanced work in this department, a student must have completed a minimum of twelve semester hours of approved preliminary courses in his chosen discipline, and twelve additional semester hours in the field or in related work. Applicants for admission should submit scores on the Graduate Record Examination, especially the Aptitude Test.

Before being admitted to candidacy for the Ph.D. degree in Sociology, an applicant is normally expected to have qualified for the A.M. degree. Candidates for the Ph.D. degree are expected to demonstrate in qualifying and preliminary examinations a broad background in the various aspects of sociology —substantive, theoretical, and empirical. The program of each candidate is determined by a committee which reviews his previous work and sets the specific requirements to be met. These requirements will include work in related fields such as anthropology, economics, mathematics, philosophy, political science, or psychology. Emphasis is placed on the completion of the dissertation, directed by a member of the staff, demonstrating competence and independence in the investigation of an original and significant problem.

Before being admitted to candidacy for the Ph.D. degree in Anthropology,

an applicant is normally expected to have qualified for the A.M. degree. Candidates for the Ph.D. degree must show evidence by preliminary or qualifying examination a command of a major field within the discipline. The department recognizes the trend in modern Anthropology toward interdisciplinary research, and part of the Anthropology course requirements may be replaced by advanced work in anatomy, economics, sociology, zoology, and other disciplines relevant to the student's program.

Further details of these programs, the departmental facilities, the staff, and various stipends available are described in a brochure which may be obtained from the Director of Graduate Studies, Department of Sociology and

Anthropology.

Professors

Kurt W. Back, Ph.D. (Massachusetts Institute of Technology); Alan C. Kerckhoff, Ph.D. (Wisconsin), Director of Graduate Studies; Weston LaBarre, Ph.D. (Yale); George L. Maddox, Jr., Ph.D. (Michigan State); John C. McKinney, Ph.D. (Michigan State), Chairman; Edgar Tristram Thompson, Ph.D. (Chicago).

Associate Professors

Thomas Owen Beidelman, Ph.D. (Oxford); John Buettner-Janusch, Ph.D. (Michigan); William M. McCormack, Ph.D. (Chicago); Robert Mortimer Marsh, Ph.D. (Columbia); Jack J. Preiss, Ph.D. (Michigan State); William L. Rowe, Ph.D. (Cornell); Donald Francis Roy, Ph.D. (Chicago); Joel Smith, Ph.D. (Northwestern); Edward A. Tiryakian, Ph.D. (Harvard); Halliman H. Winsborough, Ph.D. (Chicago).

Assistant Professors

Reynolds Farley, Ph.D. (Chicago); Jack H. Prost, Ph.D. (Chicago).

Lecturer

Mahadeo Laxman Apte, Ph.D. (Wisconsin).

Sociology

Courses of Instruction

For Seniors and Graduates

241. Social Stratification

242. The Sociology of Occupations and Professions

243. Population Dynamics and Social Change

247. Community and Society

251. The Sociology of Modernization

253. Social Institutions

255. Race and Culture

For Graduates

- 325. Social Aspects of Mental Illness and Treatment
- 341. Special Problems of Complex Systems
- 351, 352. Seminar in Social Organization
- 361. Seminar in Comparative Sociology373, 374. Social Psychological Issues in Sociology

- 259. Religion and Social Change
- 272. The Socialization Process
- 275. Social Attitudes and Individual Behavior
- 278. Social Structure and the Life Cycle
- 282. Principles of Sociological Analysis
- 295. Methodology in Sociology
- 297. Statistical Analysis in Sociology
- 381. Development of Sociological Theory
- 385, 386. Seminar in Sociological Theory
- 392. Individual Research in Sociology397, 398. Seminar in Special ResearchProblems

Anthropology

For Seniors and Graduates

- 220. Society and Culture in India
- 222. Topics in African Anthropology
- 231. Physical Anthropology (listed also as Anatomy M231)
- 238. Language and Society
- 249. Economic Anthropology
- 260. Linguistic Anthropology:

Phonemics

- 261. Linguistic Anthropology: Morphology and Syntax
- 262. Anthropology of Law
- 263. Primitive Art and Music
- 264. Primitive Religion
- 265. Personality and Society
- 266. Personality and Culture
- 276. Analysis of Kinship Systems

291, 292. Anthropological Theory

For Graduates

- 330. Seminar in Anthropology
- 393. Individual Research in Anthropology
- 410. Seminar in the Government, History, and Social Structure of India and Pakistan

Zoology

To undertake study toward an advanced degree in zoology, a student should have completed an undergraduate major in zoology or its equivalent. This normally amounts to 24 or more hours of course work distributed among various fields of zoology. Most entering students will have had organic chemistry, calculus, and a year of physics. The department recognizes the trend in modern biology towards interdisciplinary research, and part of the zoology requirements may be replaced by advanced work in chemistry, mathematics, physics, psychology, etc.

Required work for the A.M. degree ordinarily includes 12 units of advanced course work in zoology, 6 units of course work in a minor department, and an additional 6 units of advanced course work in the major or minor department, or in any other pertinent departments. Furthermore, an acceptable

thesis is necessary for the fulfillment of the degree requirements.

Candidates for the Ph.D. degree are expected to be broadly trained zoologists. The program of each candidate is determined by a committee which reviews previous training and sets the specific requirements to be made. Normally the program includes graduate courses in several fields of zoology, courses in the minor subject, wide reading in science in general and in biology in particular, research, and a dissertation based on original work. Minor work is available in many fields, including anatomy, biochemistry, botany, chemistry, geology, physics, physiology, and psychology.

Professors

Joseph Randle Bailey, *Ph.D.* (*Michigan*); Cazlyn Green Bookhout, *Ph.D.* (*Duke*); Donald J. Fluke, *Ph.D.* (*Yale*); Irving Emery Gray, *Ph.D.* (*Wisconsin*); John R. Gregg, *Ph.D.* (*Princeton*); Edward Charles Horn, *Ph.D.* (*Princeton*), *Chairman*; Daniel A. Livingstone, *Ph.D.* (*Yale*); Robert J. Menzies, *Ph.D.* (*S. California*); Knut Schmidt-Nielsen, *Mag.Sc.*, *Dr.Phil.* (*Copenhagen*); Karl Milton Wilbur, *Ph.D.* (*Pennsylvania*).

Visiting Professor Emeritus

Sally Hughes-Schrader, Ph.D. (Columbia).

Adjunct Professor

Unnsteinn Stefansson, Ph.D. (Copenhagen).

Associate Professors

John Buettner-Janusch, Ph.D. (Michigan); John DeForest Costlow, Jr., Ph.D. (Duke); Wanda Sanborn Hunter, Ph.D. (U.C.L.A.); Peter H. Klopfer, Ph.D. (Yale); R. Bruce Nicklas, Ph.D. (Columbia), Director of Graduate Studies; Vance A. Tucker, Ph.D. (U.C.L.A.); F. John Vernberg, Ph.D. (Purdue); Stephen A. Wainwright, Ph.D. (California); Calvin L. Ward, Ph.D. (Texas).

Assistant Professor

Steven Vogel, Ph.D. (Harvard).

Courses of Instruction

201. Animal Behavior (1967-68)

203. Ecology

210. Experimental Genetics

216. Limnology (Not 1967-1968)

218. Oceanographic Techniques

222. Entomology*

224. Vertebrate Zoology (1967-68)

228. Experimental Embryology (1967-68)

232. Human Genetics

238. Systematic Zoology (Not 1967-68)

243. Cytology (listed also as Botany 243)

244. Topics in Cell Structure and Function (1967-68)

245. Radiation Biology246. Physical Biology

247. Biological Nucleonics (Not 1967-

252. Comparative Physiology

271. Cellular Physiology

278. Invertebrate Embryology* 351, 352. Departmental Seminar

353, 354. Research

355, 356. Seminar

Marine Laboratory

203. Marine Ecology (Summer, 1967)

214. Biological Oceanography

215. General Physical and Chemical Oceanography

250. Physiological Ecology of Marine Animals (Summer, 1967)

274. Marine Invertebrate Zoology (Summer, 1967)

353, 354. Research 355, 356, Seminar

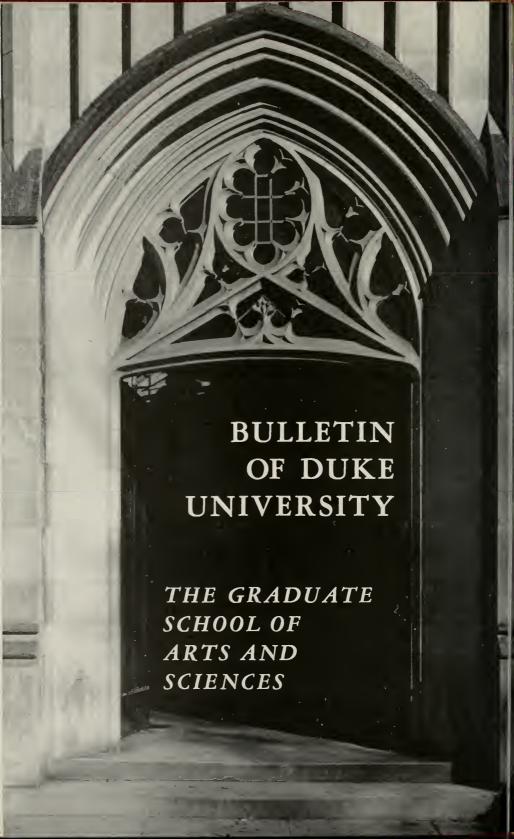
Master's Degree for Students Specializing in Physical Therapy

Students specializing in physical therapy may request admission to the Graduate School and if admitted follow the curriculum for the Master of Arts degree of either the Anatomy or Physiology Department. Selected physical therapy subjects are integrated with the graduate courses the first year. A thesis and the remaining physical therapy courses and practicum may be completed the second year. Upon satisfactory completion of these requirements a Master of Arts degree and a Certificate in Physical Therapy will be awarded. For information concerning the Physical Therapy Program write Miss Helen Kaiser, Director, Physical Therapy Department, Box 3247, Duke University Medical Center.









BULLETIN

of Duke University

COURSES IN DIVINITY SCHOOL DUKE UNIVERSITY SUMMER SESSION

1967

DURHAM, NORTH CAROLINA

First Term: June 12—July 18

Second Term: July 20—Aug. 25

Volume 39

January, 1967

Number 3-B

Calendar of the Summer Session 1967

>>>

June 11—Sunday, 12 o'clock noon.

Dormitory rooms ready for occupancy

June 12—Monday

Registration for the First Term in the Summer Session Office, 119 Allen Building, 8:30 A.M.-1:00 P.M.

June 13-Tuesday
Instruction begins for First Term

July 17-18—Monday-Tuesday Final examinations for First Term

July 20—Thursday, 8:30-1:00 Registration for Second Term

July 21—Friday
Instruction begins for Second Term

August 24-25—Thursday-Friday
Final examinations for Second Term

All classes meet six days a week—Monday through Saturday. Classes will not meet, however, July 3-4, Monday-Tuesday; and Saturday, August 12.

Published by Duke University monthly except in July, August, September, and December. Entered as second-class matter March 25, 1929, at the Post Office of Durham, North Carolina, under the Act of August 24, 1912.

Administrative Officers

≥°€

DOUGLAS MAITLAND KNIGHT, Ph.D. President of Duke University

ROBERT TAYLOR COLE, Ph.D.

FRANK TRAVER DE VYVER, Ph.D. Vice Provost

OLAN LEE PETTY, Ph.D. Director of the Summer Session

Advisory Committee on Courses in Religion

ROBERT E. CUSHMAN, B.D., Ph.D. Dean of the Divinity School

OSMOND KELLY INGRAM, B.D. Dean of Students

HELEN MILDRED KENDALL, A.B. Administrative Assistant and Registrar

WILLIAM ARTHUR KALE, B.D., D.D. Director of Field Education

WALDO BEACH, B.D., Ph.D. Director of Graduate Studies in Religion

Faculty

JAMES MICHAEL EFIRD, B.D., Ph.D. Assistant Professor of New Testament

RICHARD A. GOODLING, B.D., Ph.D. Associate Professor of Pastoral Care

EGIL GRISLIS, B.D., Ph.D. Associate Professor of Historical Theology

DWIGHT MOODY SMITH, JR., B.D., Ph.D. Associate Professor of New Testament

DONALD S. WILLIAMSON, B.D., Ph.D. Assistant Professor of Pastoral Care

Duke University Summer Session

THERE will be two terms of the Duke University Summer Session of 1967. The first term will begin on June 12 and end on July 18. The second term will begin on July 20 and end on August 25.

Courses in religion and related fields will be offered in the Duke University Summer Session. These courses are subject to all the regulations of the Duke University Summer Session as published in the Summer Session Bulletin. Divinity School credits will count on the Bachelor of Divinity, Master of Theology, and Master of Religious Education degrees. Graduate School credits will count on the Master of Arts and Doctor of Philosophy degrees. These credits may, of course, be transferred to other colleges, universities, and theological schools in the same way that such transfer of credit is usually made.

Candidates for degrees from Duke University shall be formally admitted to the school which will confer the degree. Candidates for the B.D. and M.R.E. degrees must be admitted to the Divinity School; candidates for the A.M. and Ph.D. degrees must be admitted to the Graduate School of Arts and Sciences.

Pre-Enrollment

Students in residence at Duke University during the spring semester 1967 who plan to enroll for courses offered in the 1967 Summer Session will pre-enroll on the following dates:

The Divinity School April 13-14

Students not in residence may pre-enroll by mail. Request for application blank should be made to the Summer Session Office, Duke University. Completed applications should be mailed to the Dean of the Divinity School, Duke University.

Registration

Students in residence who have pre-enrolled on April 13 and 14 may complete their registration in the Summer Session Office on May

10-June 5. Advance registration in the Summer Session Office includes:

- 1. Completion of various Summer Session forms.
- 2. Payment of University fees.

Students not in residence at Duke University during the spring semester of 1967 whose applications are approved by the Dean of the Divinity School may complete registration by mail through June 5. Advance registration by mail with the Summer Session Office includes:

- 1. Completion in full and return of forms required by the Summer Session Office by June 5.
- 2. Payment of University fees by June 5.

Students who complete registration with the Summer Session Office on or before June 5 need not be present at the general registration on June 12. They will meet classes on June 13.

All Summer Session students whose classes begin on June 13, Term I, who do not complete registration in the Summer Session Office on or before June 5 must present themselves at general registration in the Summer Session Office, 119 Allen Building, on June 12 to register.

Any student who fails to register on or before June 12, Term I, July 20, Term II, will be charged a fee of \$5.00 for late registration.

All changes in courses other than those required by the University will require a payment of \$1.00 for each change made.

Fees and Expenses

The University fee is as follows:

Covering registration, tuition and medical care \$40.00 per semester hour.

One half of the above fee is rebated to students enrolled in the Divinity School, who will pay \$20.00 per semester hour.

Applications for admission may be obtained from either the Divinity School Office or the Summer Session Office.

Room and Board

In all dormitories the rate of room rent is \$43.75, per term, for each student, where two students occupy a room. Single rooms are available at the rate of \$51.25 for each term, but in limited numbers. Graduate and undergraduate students will be assigned to separate residence halls in so far as is possible. The Divinity School and

Housing office will be glad to assist married students in locating accommodations for themselves and their families off the campus. Occupants of the University rooms furnish their own bed linen, blankets, pillows, and towels. Applications for rooms should be made to the Housing office.

Board will be provided in the University cafeteria at approximately \$72.00 for each term depending upon the needs and tastes of the individual.

Advanced Degrees

The degrees of Bachelor of Divinity, Master of Theology, and Master of Religious Education are offered in the Divinity School.

The degrees offered in the Graduate School of Arts and Sciences are Master of Arts and Doctor of Philosophy.

Graduate study in religion leading to the degrees of Master of Arts and Doctor of Philosophy may be pursued in three fields: (1) Biblical Studies; (2) Studies in Church History; and (3) Studies in Christian Theology and Ethics.

Candidates for advanced degrees must be graduates of colleges of recognized standing.

Upon request the Director of the Summer Session or the Dean of the Divinity School will furnish bulletins containing detailed description of the academic requirements for the degrees of Bachelor of Divinity, Master of Theology, Master of Religious Education, Master of Arts, and Doctor of Philosophy.

Religious Services

University religious services are held each Sunday morning at 9:30 o'clock in the University Chapel. All students are cordially invited to attend.

The Summer Session of the Divinity School

·>·

Summer, 1967

Class enrollments will be controlled as occasion may arise so as to secure a fairly even distribution among the courses offered in each term.

FIRST TERM: (Registration June 12, Classes begin June 13 and end July 18)

101 (DS) POST EXILIC PROPHECY.—A study of the post-Exilic prophets from Ezekiel to Daniel, with special reference to messianic prophecy and related theological problems. 3 s.h. 9:20-10:40

MR. EFIRD

121 (DS) SACRAMENTS IN THE CHRISTIAN CHURCH.—Ecumenical studies in devotion and division: Baptism and the Lord's Supper. 3 s.h. 11:00-12:20

MR. GRISLIS

171 (DS) INTRODUCTION TO PASTORAL COUNSELING.—Intensive consideration of pastoral counseling structure and process. 3 s.h. 7:40-9:00

Mr. WILLIAMSON

SECOND TERM: (Registration July 20, Classes begin July 21 and end Aug. 25)

107 (DS) THE CHURCH IN THE NEW TESTAMENT.—An exegetical consideration of the important New Testament texts relevant to the development of church order, ministry, sacraments, and/or other important dimensions of the primitive community and its self-consciousness. 3 s.h. 9:20-10:40 Mr. M. SMITH

174 (DS) RELIGION AND PERSONALITY PROCESSES.—Psychological and religious interpretation of man's basic experiences: personality factors in religious belief and practice. 3 s.h. 7:40-9:00 Mr. Goodling

DIVINITY SCHOOL SUMMER CLINICS

Summer Clinics in CHURCH PLANNING AND DEVELOP-MENT, PASTORAL CARE, PREACHING, and SYSTEMATIC THEOLOGY, and possibly other topics will be held simultaneously July 17-28, 1967. These clinics are designed to supplement seminary education through two weeks of intensive training in one selected subject. Each has its own leaders and schedule. However, the several groups will be together for special features and lectures. Registration is open to ministers of all denominations. Participants are expected to attend the full two weeks from the opening dinner to the closing luncheon. No academic credit is given. Please address requests for information, costs and financial aid to: Dr. M. Wilson Nesbitt, Director and Registrar, Box 4814, Duke Station, Durham, North Carolina.

The Methodist Course of Study School July 10-August 4, 1967

O. Kelly Ingram, *Director*Box 4484, Duke Station
Durham, North Carolina 27706

The Methodist Course of Study School, the nineteenth session of the short term school for Methodist ministers taking the required Course of Study, will be conducted during the period, July 10-August 4, 1967. While this school is designed primarily for supply pastors and other non-seminary candidates for the Methodist ministry, clergymen of any denomination may enroll. The curriculum as approved by the 1964 Methodist General Conference will be followed, which will include Studies for License to Preach, Introductory Studies, and the Studies for the First, Second, Third, and Fourth Years.

In addition to class work, there is provision for daily worship in Duke Chapel and a number of special lectures and workshops. A varied program of recreation and athletics will be supervised by the University Department of Physical Education.

Registration is scheduled for July 10. Classes begin on the morning of July 11 and continue through August 4, including Saturdays. A descriptive folder giving details of the School will be ready for distribution about March 15, 1967, and copies may be procured by writing to Professor O. K. Ingram, Director, Box 4484, Duke Station, Durham, N. C. 27706.

BULLETIN OF DUKE UNIVERSITY

Graduate School of Arts and Sciences 1967



Annual Bulletins

For Bulletin of Information for Prospective Students, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The School of Engineering, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to The Dean of the Divinity School, Duke University, Durham, N. C.

For Bulletin of The School of Forestry, apply to The Dean of the School of Forestry, Duke University, Durham, N. C.

For Bulletin of The Graduate School of Arts and Sciences, apply to The Dean of the Graduate School, Duke University, Durham, N. C.

For Bulletin of The School of Law, apply to The Dean of the School of Law, Duke University, Durham, N. C.

For Bulletin of The School of Medicine, apply to The Dean of the School of Medicine, Duke University, Durham, N. C.

For Bulletin of The School of Nursing, apply to The Dean of the School of Nursing, Duke University, Durham, N. C.

For Bulletin of The Summer Session, apply to The Director of the Summer Session, Duke University, Durham, N. C.

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Name and Address of Editor: Frank T. de Vyver, Vice Provost, Duke University, Durham, North Carolina.

Name and Address of Managing Editor: Mrs. Beverly Penny, Assistant to the Vice Provost, Duke University, Durham, North Carolina.

Owner: Duke University, Durham, North Carolina.

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BULLETIN OF DUKE UNIVERSITY

Graduate School of Arts and Sciences 1967



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Calendar of the Graduate School

Summer Session 1967*

April

Advanced registration for current students for 1967 Summer 12-13 Session (and for fall semester, 1967).

June

- Monday—Registration of students for Summer Session, first term. 12
- Tuesday—Instruction begins for Summer Session, first term. 13
- Friday—Final date for filing with the Graduate Office Statement 23 of Intention to complete, during the first term, requirements for the Master's degree. If a thesis is to be presented, the title is to be filed at the same time as the Statement of Intention.

July

- Monday-Registration closes for ETS examinations. 3
- Wednesday-French and Spanish examinations for candidates for graduate degrees, 4:00 p.m., 229 Allen Building. Candidates register in the Graduate School Office not later than June 23.
- Wednesday-English examinations for foreign students; room 12 and hours to be announced. Register in the Graduate School Office through July 5.
- Tuesday-First term of Summer Session ends. 18
- Thursday-Registration of students for second term of Summer 20 Session.
- Friday-Instruction begins for second term of Summer Session. 21
- Monday-Final date for filing with the Graduate Office State-24 ment of Intention to complete, during the second term, requirements for the Master's degree. If a thesis is to be presented, the title is to be filed at the same time as the Statement of Intention.

Fee increases effective September, 1967, do not apply to 1967 Summer Session.

August

5 Saturday—ETS language examinations in French, German, and Russian, 9:00 a.m., 125 Engineering Building; registration at University Counseling Center through July 3, fee \$8.

14 Monday-Last day for submitting theses for Master's degree.

25 Friday-Second term of Summer Session ends.

Friday—Final date for completion of requirements for degree to be awarded September 1, by the Graduate School of Arts and Sciences.

Academic Year 1967-68

September

- 18 Monday—Reading, Vocabulary, and Grammar Tests in French, Spanish and German: French and Spanish, 9:00 a.m.; German, 10:15 a.m.; both in 111 Biological Sciences Building. (See page 55 for information.) English examination for Foreign Students; room and hours to be announced. Consultation with Directors of Graduate Study concerning course program.
- 19 Tuesday—Registration for new and non-pre-registered returning students. Indoor Stadium, 9–12 a.m. and 2–3:30 p.m.
- 20 Wednesday—Course changes only. Indoor Stadium, 9-12:30.
- 20 Wednesday-University Convocation. Indoor Stadium, 8 p.m.

21 Thursday-Classes begin.

- 25 Monday—French and Spanish examination for candidates for preliminary examinations and for graduate degrees, 4:00 p.m., Room 229 Allen Building. Candidates register in the Graduate School Office for these examinations not later than September
- 26 Tuesday-Registration closes for ETS examinations.

October

28 Saturday—ETS language examinations in French, German, and Russian; registration at University Counseling Center through September 26, fee \$8.

November

15–16 Wednesday, Thursday—Spring pre-registration.

- 15 Wednesday—English examination for foreign students; room and hours to be announced. Register in the Graduate School Office through November 9.
- 22 Wednesday, 12:30 p.m.—Thanksgiving recess begins.
- 27 Monday, 8:10 a.m.—Classes are resumed.

December

11 Monday-Founders Day.

20 Wednesday, 12:30 p.m. Christmas recess begins.

January

3 Wednesday, 8:10 a.m.—Classes are resumed.

3 Wednesday-Registration closes for ETS examinations.

9 Tuesday—French and Spanish examination for candidates for graduate degrees, 4:00 p.m., 229 Allen Building. Candidates register in the Graduate School Office for these examinations not later than December 18, 1967.

13-17 Reading Period.

17 Wednesday-Final examinations begin.

26 Friday-Final examinations end.

29 Monday—Reading, Vocabulary, and Grammar Tests in French, Spanish, and German for entering students, second semester. French and Spanish 10:30 a.m., German, 11:45 a.m., both in 125 Engineering Building. (See page 55 for information.)

31 Wednesday-Registration for students not in residence during first semester and for current students who failed to pre-

register. Indoor Stadium.

February

1 Thursday—Classes are resumed.

3 Saturday—ETS language examinations in French, German, and Russian; registration at University Counseling Center through January 3, fee \$8.

Last day for applying for University fellowships, graduate assis-

tantships, and graduate scholarships.

March

- Final date for filing with Graduate Office Statement of Intention of receiving advanced degree in June. Titles of theses and dissertations are to be filed concurrently with the Statement of Intention.
- 23 Saturday, 12:30 p.m.—Spring recess begins.

April

Monday, 8:10 a.m.—Classes are resumed.

8 Monday—French and Spanish examinations for candidates for graduate degrees, 4:00 p.m., 229 Allen. Candidates register in the Graduate School Office for these examinations not later than March 22.

10-11 Wednesday, Thursday-Fall and summer pre-registration.

15 Monday-Last day for submittting theses for degrees of Doctor

of Philosophy and Doctor of Education.

20 Saturday—ETS language examinations in French, German, and Russian; registration at University Counseling Center through March 19, fee \$8.

May

- 1 Wednesday—Last day for submitting theses for degrees of Master of Arts, Master of Science, Master of Education, and Master of Arts in Teaching.
- 2 Thursday—English examination for foreign students; room and hours to be announced. Register in the Graduate School Office through April 25.

17–20 Reading period.

- 20 Monday-Final examinations begin.
- 29 Wednesday—Final examinations end.

June

- 1 Saturday-Commencement begins.
- 2 Sunday-Commencement sermon.
- 3 Monday-Graduating Exercises.

Last Dates for Applying for Admission

Fall Semester, with Award		
Fall Semester, Admission Only	August	1
Spring Semester		
Summer Session, First Term	May	12
Summer Session, Second Term	June	20

Officers of the University Administration

Douglas Maitland Knight, Ph.D., Litt.D., LL.D., L.H.D., President of the University

R. Taylor Cole, Ph.D., Provost

Frank Leon Ashmore, A.B., Vice President for Institutional Advancement Gerhard Chester Henricksen, M.A., C.P.A., Vice President and Treasurer Everett Harold Hopkins, M.A., LL.D., Vice President for Planning and Institutional Studies, Assistant Provost

Charles B. Huestis, Vice President for Business and Finance

Frank Traver de Vyver, Ph.D., Vice Provost

Harold W. Lewis, Ph.D., Vice Provost

Richard Lionel Predmore, D.M.L., Vice Provost

Barnes Woodhall, M.D., Vice Provost

Craufurd David Goodwin, Ph.D., Assistant Provost

Robert H. Ballantyne, Ed.D., Assistant to the President for Planning

Benjamin Edward Powell, Ph.D., Librarian

Richard Lovejoy Tuthill, Ed.D., University Registrar

Rufus H. Powell, LL.B., Secretary of the University

Edwin Constant Bryson, LL.B., University Counsel

Graduate School Administration

Richard Lionel Predmore, D.M.L., Dean of the Graduate School of Arts and Sciences

Francis Ezra Bowman, Ph.D., Secretary of the Graduate Faculty, Associate Dean, Acting Dean, and Director of Admissions, Graduate School of Arts and Sciences

David V. Martin, Ed.D., Assistant Dean

Executive Committee of the Graduate Faculty

Waldo Beach*
Dwight Billings
Francis E. Bowman

Robert Durden Norman Guttman* Daniel A. Livingstone* Richard L. Predmore Charles R. Vail° Seth L. Warner

Benjamin Boyce

^{*} Term ends September, 1967.

Members of the Graduate School Faculty (as of November 1, 1966)

The date denotes the first year of service at Duke University.

Frances Dorothy Acomb (1945) Ph.D., Associate Professor of History
Donald Keith Adams (1931) Ph.D., Professor of Psychology
John Richard Alden (1955) Ph.D., James B. Duke Professor of History

*Irving Alexander (1963) Ph.D., Professor of Psychology
John C. Altrocchi (1957) Ph.D., Associate Professor of Psychology
D. Bernhard Amos (1962) M.D., Professor of Immunology

**Hugh Anderson (1957) Ph.D., Professor of Biblical Criticism and
Theology

Lewis Edward Anderson (1936) Ph.D., Professor of Botany Roger Fabian Anderson (1950) Ph.D., Professor of Forest Entomology John Leslie Artley (1955) D.Eng., Professor of Electrical Engineering Kurt W. Back (1959) Ph.D., Professor of Sociology Joseph Randle Bailey (1946) Ph.D., Professor of Zoology

Frank Baker (1960) Ph.D., Professor of Religion

M. Margaret Ball (1963) Ph.D., Professor of Political Science

Robert H. Ballantyne (1962) Ed.D., Assistant Professor of Education Katherine May Banham (1946) Ph.D., Associate Professor of Psychology Robert Lloyd Barnes (1965) Ph.D., Professor of Forest Biochemistry Furman Wyche Barton (1964) Ph.D., Associate Professor of Civil Engineering

Charles A. Baylis (1952) Ph.D., Professor of Philosophy William Waldo Beach (1946) B.D., Ph.D., Professor of Christian Ethics Joseph Willis Beard (1937) M.D., Professor of Virology Roland Frederick Becker (1951) Ph.D., Associate Professor of Anatomy

^{*} Absent on Leave, 1966–67. ** Resigned, August 31, 1966.

Thomas O. Beidelman (1965) Ph.D., Associate Professor of Sociology Peter J. Bentley (1966) Ph.D., Associate Professor of Physiology Frederick Bernheim (1930) Ph.D., James B. Duke Professor of Pharmacology

Mrs. Mary L. C. Bernheim (1930) Ph.D., Professor of Biochemistry Thomas W. Best (1966) Ph.D., Assistant Professor of German L. C. Biedenharn, Jr. (1961) Ph.D., Professor of Physics

William Dwight Billings (1952) Ph.D., Professor of Botany

*Edward Georges Bilpuch (1962) Ph.D., Associate Professor of Physics ††Robert W. Binkley (1957) Ph.D., Assistant Professor of Philosophy

Martin Lee Black, Jr. (1930) M.B.A., C.P.A., Professor of Accounting ° John O. Blackburn (1959) Ph.D., Associate Professor of Economics

J. J. Blum (1962) Ph.D., Associate Professor of Physiology

Edward Claude Bolmeier (1948) Ph.D., Professor of Education

††Charles Alan Boneau (1957) Ph.D., Associate Professor of Psychology

Cazlyn Green Bookhout (1935) Ph.D., Professor of Zoology

°Lloyd J. Borstelmann (1953) Ph.D., Associate Professor of Psychology Jack Botwinick (1963) Ph.D., Associate Professor of Psychology

Francis Ezra Bowman (1945) Ph.D., Professor of English

Benjamin Boyce (1950) Ph.D., Professor of English

Thomas Allen Boyle, Jr. (1957) M.S. in M.E., Associate Professor of Mechanical Engineering

Melvin O. Braaten (1965) Ph.D., Assistant Professor of Forest Biometry Charles Kilgo Bradsher (1939) Ph.D., James B. Duke Professor of Chemistry

Ralph Braibanti (1953) Ph.D., Professor of Political Science

Jack Brehm (1958) Ph.D., Professor of Psychology Rubin Bressler (1961) M.D., Professor of Physiology

"Earl Ivan Brown, II (1960) Ph.D., J. A. Jones Professor of Civil Engineering

Frances Campbell Brown (1931) Ph.D., Professor of Chemistry Ray E. Brown (1964) M.B.A., Professor of Hospital Administration Edward H. Bryan (1960) Ph.D., Professor of Civil Engineering Marion R. Bryson (1962) Ph.D., Assistant Professor of Mathematics

Louis J. Budd (1952) Ph.D., Professor of English

John Buettner-Janusch (1965) Ph.D., Associate Professor of Anatomy Donald S. Burdick (1962) Ph.D., Assistant Professor of Mathematics

Robert Mercer Burger (1962) Ph.D., Adjunct Associate Professor of Electrical Engineering

Jacob Burlak (1965) Ph.D., Associate Professor of Mathematics R. O. Burns (1964) Ph.D., Assistant Professor of Microbiology

[°] Absent on Leave, 1966-67. ° Absent on Sabbatical Leave, 1966-67. †† Resigned, August 31, 1966.

††William S. Bush (1962) Ph.D., Associate Professor of Romance Languages

Gale H. Buzzard (1964) M.S., Assistant Professor of Mechanical Engi-

neering

William Lawrence Byrne (1954) Ph.D., Associate Professor of Biochemistru

Leonard Carlitz (1932) Ph.D., James B. Duke Professor of Mathematics Robert C. Carson (1960) Ph.D., Associate Professor of Psychology William H. Cartwright (1951) Ph.D., Professor of Education

Jack B. Chaddock (1966) Sc.D., Professor of Mechanical Engineering Clifton C. Cherpack (1958) Ph.D., Professor of Romance Languages

Donald B. Chesnut (1965) Ph.D., Associate Professor of Chemistry Kenneth Willis Clark (1931) Ph.D., Professor of New Testament *Romane Lewis Clark (1953) Ph.D., Professor of Philosophy

Sanford I. Cohen (1957) M.D., Lecturer in Psychology

Robert Taylor Cole (1935) Ph.D., James B. Duke Professor of Political Science

Joel G. Colton (1947) Ph.D., Professor of History

*Robert Merle Colver (1953) Ed.D., Associate Professor of Education Norman Francis Conant (1935) Ph.D., James B. Duke Professor of Microbiology

†Robert Howe Connery (1949) Ph.D., Professor of Political Science

Robert L. Cook (1963) Ph.D., Instructor in Physics

Thomas Howard Cordle (1950) Ph.D., Associate Professor of Romance Languages

*John Costlow (1959) Ph.D., Associate Professor of Zoology Robert I. Crane (1961) Ph.D., Professor of History

Herbert F. Crovitz (1961) Ph.D., Lecturer in Psychology

William L. Culberson (1955) Ph.D., Associate Professor of Botany

John Shelton Curtiss (1945) Ph.D., James B. Duke Professor of History Robert Earle Cushman (1945) B.D., Ph.D., Professor of Systematic

Theology

Bingham Dai (1943) Ph.D., Professor of Psychology
Eugene A. Davidson (1958) Ph.D., Professor of Biochemistry
David G. Davies (1961) Ph.D., Professor of Economics
Calvin D. Davis (1962) Ph.D., Associate Professor of History
Gifford Davis (1930) Ph.D., Professor of Romance Languages
Eugene Davis Day (1962) Ph.D., Professor of Immunology
*Louis De Alessi (1961) Ph.D., Associate Professor of Economics
Frank Traver de Vyver (1935) Ph.D., Professor of Psychology
Neal Dow (1934) Ph.D., Professor of Romance Languages

†† Resigned, August 31, 1966.

^{*} Absent on Leave, 1966-67.

^{**} Absent on Sabbatical Leave, 1966-67.

Francis George Dressel (1929) Ph.D., Professor of Mathematics Bernard Duffey (1960) Ph.D., Professor of English Kenneth Lindsay Duke (1940) Ph.D., Associate Professor of Anatomy Robert F. Durden (1952) Ph.D., Professor of History Carl Eisdorfer (1956) Ph.D., Lecturer in Psychology Jane G. Elchlepp (1956) Ph.D., Assistant Professor of Pathology William Whitfield Elliott (1925) Ph.D., Professor of Mathematics Ernest Elsevier (1950) M.S. in M.E., Associate Professor of Mechanical Engineering R. P. Erickson (1961) Ph.D., Associate Professor of Psychology Lawrence Evans (1963) Ph.D., Assistant Professor of Physics Edwin Vaughan Evarts (1961) M.D., Associate Professor of Physiology John Wendell Everett (1932) Ph.D., Professor of Anatomy Henry A. Fairbank (1961) Ph.D., Professor of Physics W. Reynolds Farley (1964) Ph.D., Assistant Professor of Sociology John Morton Fein (1950) Ph.D., Professor of Romance Languages Arthur Bowles Ferguson (1939) Ph.D., Professor of History Charles E. Ferguson (1957) Ph.D., Professor of Economics Oliver Ferguson (1957) Ph.D., Associate Professor of English Bernard F. Fetter (1951) M.D., Associate Professor of Pathology John Francis Flanagan (1961) M.D., Assistant Professor of Microbiology Donald J. Fluke (1957) Ph.D., Professor of Zoology Lloyd R. Fortney (1964) Ph.D., Assistant Professor of Physics Earle Fowler (1962) Ph.D., Professor of Physics Wallace Fowlie (1964) Ph.D., Professor of Romance Languages Charles H. Frenzel (1955) A.B., Professor of Hospital Administration Irwin Fridovich (1958) Ph.D., Associate Professor of Biochemistry Mercedes Gaffron (1958) M.D., Ph.D., Associate Professor of Psychology Thomas M. Gallie, Ir. (1954-55; 1956) Ph.D., Associate Professor of Mathematics Ila Gehman (1959) Ed.D., Lecturer in Psychology W. Scott Gehman, Jr. (1954) Ph.D., Associate Professor of Psychology in Education Rhett Truesdale George, Jr. (1957) Ph.D., Assistant Professor of Electrical Engineering John Jay Gergen (1936) Ph.D., Professor of Mathematics ††Hans Gerhard (1959) Ph.D., Associate Professor of Economics Donald G. Gillin (1959) Ph.D., Associate Professor of History Donald E. Ginter (1963) Ph.D., Assistant Professor of History Sherwood Githens (1962) Ph.D., Professor of Science Education Clarence Gohdes (1930) Ph.D., James B. Duke Professor of English

Craufurd Goodwin (1962) Ph.D., Assistant Professor of Economics Walter Gordy (1946) Ph.D., LL.D., D.H.C., James B. Duke Professor of

†† Resigned, August 31, 1966.

Physics

Richard Babson Grant (1952) Ph.D., Associate Professor of Romance

Languages

Irving Emery Gray (1930) Ph.D., Professor of Zoology

Ronald C. Greene (1958) Ph.D., Assistant Professor of Biochemistry ¶Donald D. Greenwood (1964) Ph.D., Assistant Professor of Physiology

John R. Gregg (1957) Ph.D., Professor of Zoology Eugene Grueling (1948) Ph.D., Professor of Physics

Thomas Alan Griffy (1961) Ph.D., Assistant Professor of Physics

Egil Grislis (1961) Ph.D., Associate Professor of Religion

Samson Gross (1960) Ph.D., Professor of Genetics and Biochemistry

Walter R. Guild (1960) Ph.D., Professor of Biophysics

Norman Guttman (1951) Ph.D., Associate Professor of Psychology Robert A. Guyer (1964) Ph.D., Assistant Professor of Physics

Donald B. Hackel (1960) M.D., Professor of Pathology

Herbert Hacker, Jr. (1965) Ph.D., Assistant Professor of Electrical Engineering

Hugh Marshall Hall, Jr. (1953) Ph.D., Associate Professor of Political Science

Louise Hall (1931) S.B.Arch., Ph.D., Professor of Architecture John Hamilton Hallowell (1942) Ph.D., Professor of Political Science William Baskerville Hamilton (1936) Ph.D., Professor of History

Philip Handler (1939) Ph.D., James B. Duke Professor of Biochemistry and Nutrition

Frank Allan Hanna (1948) Ph.D., Professor of Economics

Charles Morgan Harman (1961) Ph.D., Associate Professor of Mechanical Engineering

Ellwood Scott Harrar (1936) Ph.D., Professor of Wood Technology

Paul Harrawood (1956) M.S., Assistant Professor of Civil Engineering

A. Brooks Harris (1963) Ph.D., Instructor of Physics

Charles Roy Hauser (1929) Ph.D., James B. Duke Professor of Chemistry Henry Hellmers (1965) Ph.D., Professor of Botany

Simeon K. Heninger (1955) Ph.D., Professor of English

Stuart C. Henry (1959) Ph.D., Professor of American Christianity

Duncan Heron (1950) Ph.D., Associate Professor of Geology

Javier Herrero (1966) Ph.D., Associate Professor of Romance Languages

Frederick Herzog (1960) B.D., Th.M., Th.D., Associate Professor of Systematic Theology

David William Hill (1962) Ph.D., Associate Professor of Civil Engineering

Douglas Greenwood Hill (1931) Ph.D., Professor of Chemistry

R. L. Hill (1962) Ph.D., Professor of Biochemistry

Hans J. Hillerbrand (1959) Ph.D., Associate Professor of Modern European Christianity

Frederick R. Hine (1958) M.D., Associate Professor of Psychology

¶¶ Resigned, December 31, 1965.

Lowell A. Hinrichs (1962) Ph.D., Assistant Professor of Mathematics Marcus Edwin Hobbs (1935) Ph.D., Professor of Chemistry Paul E. Hochstein (1963) Ph.D., Assistant Professor of Physiology Richard Earl Hodel (1965) Ph.D., Assistant Professor of Mathematics

Irving B. Holley, Jr. (1947) Ph.D., Professor of History

Frederic B. M. Hollyday (1959) Ph.D., Assistant Professor of History *** Calvin Bryce Hoover (1925) Ph.D., Litt.D., James B. Duke Professor of Economics

Everett H. Hopkins (1961) LL.D., Professor of Education **Edward Charles Horn (1946) Ph.D., Professor of Zoology

Paul Horowicz (1961) Ph.D., Professor of Physiology

I. Woodford Howard (1962) Ph.D., Associate Professor of Political Science

Alexander Hull (1962) Ph.D., Associate Professor of Romance Languages

Earle R. Hunt (1964) Ph.D., Assistant Professor of Physics

Mrs. Wanda Sanborn Hunter (1947) Ph.D., Associate Professor of Zoology

Allan S. Hurlburt (1956) Ph.D., Professor of Education Mary Huse (1962) Ph.D., Lecturer in Psychology

Peter W. Jeffs (1964) Ph.D., Assistant Professor of Chemistry

Bronislas de Leval Jezierski (1958) Ph.D., Associate Professor of Russian Language and Literature

Frans F. Jobsis (1964) Ph.D., Associate Professor of Physiology Edward A. Johnson (1963) B.S., Associate Professor of Physiology Terry W. Johnson, Jr. (1954) Ph.D., Professor of Botany

William Thomas Joines (1966) Ph.D., Assistant Professor of Electrical Engineering

Edward Ellsworth Jones (1953) Ph.D., Professor of Psychology Leon Lloyd Jones (1963) Ph.D., Assistant Professor of Chemistry

Henry Kamin (1948) Ph.D., Professor of Biochemistry Nathan Kaufman (1960) M.D., Professor of Pathology

John A. Kelingos (1963) Ph.D., Assistant Professor of Mathematics

Van Leslie Kenyon, Jr. (1945) M.M.E., Professor of Mechanical Engineering

Alan C. Kerckhoff (1958) Ph.D., Professor of Sociology

Robert B. Kerr (1965) Ph.D., Associate Professor of Electrical Engineering

**Gregory Adams Kimble (1952) Ph.D., Professor of Psychology Thomas DeArman Kinney (1960) M.D., Professor of Pathology Norman Kirshner (1956) Ph.D., Associate Professor of Biochemistry

Joseph Weston Kitchen, Jr. (1962) Ph.D., Assistant Professor of Mathematics

*** Absent on Leave, 1966-67.

Absent on Sabbatical Leave, Fall Semester, 1966. ° Absent on Sabbatical Leave, 1966-67.

Peter H. Klopfer (1958) Ph.D., Associate Professor of Zoology K. R. Knoerr (1961) Ph.D., Associate Professor of Forestry Allan Kornberg (1965) Ph.D., Assistant Professor of Political Science Jack L. Kostyo (1959) Ph.D., Professor of Physiology Paul Jackson Kramer (1931) Ph.D., James B. Duke Professor of Botany Irwin Kremen (1963) Ph.D., Assistant Professor of Psychology Juanita M. Kreps (1955) Ph.D., Associate Professor of Economics "William R. Krigbaum (1952) Ph.D., Professor of Chemistry Magnus Jan Krynski (1966) Ph.D., Associate Professor of Russian Wladyslaw W. Kulski (1963) Dr. jur., James B. Duke Professor of Russian Affairs

*Weston La Barre (1946) Ph.D., Professor of Anthropology Leon Lack (1965) Ph.D., Assistant Professor of Physiology

*Creighton Lacy (1953) B.D., Ph.D., Professor of Missions and Social **Ethics**

Martin Lakin (1958) Ph.D., Associate Professor of Psychology Thomas Langford (1956) Ph.D., Associate Professor of Religion John Tate Lanning (1927) Ph.D., James B. Duke Professor of History John E. Larsh, Jr. (1943) Sc.D., Professor of Parasitology Richard H. Leach (1955) Ph.D., Professor of Political Science Warren Lerner (1961) Ph.D., Associate Professor of History Harold Walter Lewis (1949) Ph.D., Professor of Physics John B. Lewis (1961) Ph.D., Associate Professor of Electrical Engineering John L. Lievsay (1962) Ph.D., Professor of English Darwyn E. Linder (1965) Ph.D., Assistant Professor of Psychology L. Sigfred Linderoth, Jr. (1965) M.E., Professor of Mechanical Engineering

Daniel A. Livingstone (1956) Ph.D., Professor of Zoology Gregory Lockheed (1965) Ph.D., Assistant Professor of Psychology E. Croft Long (1956) M.D., Associate Professor of Physiology and Pharmacology

William S. Lynn, Jr. (1954) M.D., Associate Professor of Biochemistry George W. Lynts (1965) Ph.D., Assistant Professor of Geology K. S. McCarty (1950) Ph.D., Associate Professor of Biochemistry William McCormack (1964) Ph.D., Associate Professor of Sociology ** John S. McGee (1962) Ph.D., Professor of Economics

John C. McKinney (1957) Ph.D., Professor of Sociology Thomas J. McManus (1961) M.D., Assistant Professor of Physiology John Nelson Macduff (1956) M.E.E., Professor of Mechanical Engineer-

George L. Maddox (1960) Ph.D., Professor of Sociology

Moses S. Mahaley (1965) Ph.D., Assistant Professor of Anatomy Edward P. Mahoney (1965) Ph.D., Assistant Professor of Philosophy

*Absent on Sabbatical Leave, 1966-67. Absent on Leave, 1966-67.

Alan Krebs Manchester (1929) Ph.D., Professor of History *Ioseph Eldridge Markee (1943) Ph.D., James B. Duke Professor of Anatomy

Sidney David Markman (1947) Ph.D., Professor of Art History and

Archaeology

Robert M. Marsh (1965) Ph.D., Associate Professor of Sociology David V. Martin (1962) Ed.D., Assistant Professor of Education Otto Meier, Jr. (1934) Ph.D., Professor of Electrical Engineering

Robert J. Menzies (1962) Ph.D., Professor of Zoology

James Lathrop Meriam (1963) Ph.D., Professor of Engineering Mechanics Richard S. Metzgar (1962) Ph.D., Associate Professor of Immunology Johannes Horst Max Meyer (1959) D.Sc., Professor of Physics

John W. Moore (1961) Ph.D., Professor of Physiology

Montrose J. Moses (1959) Ph.D., Professor of Anatomy **Francis Joseph Murray (1960) Ph.D., Professor of Mathematics

Toshio Narahashi (1965) Ph.D., Assistant Professor of Physiology Aubrey Willard Naylor (1952) Ph.D., Professor of Botany

Thomas H. Naylor (1964) Ph.D., Associate Professor of Economics

Glenn Robert Negley (1946) Ph.D., Professor of Philosophy Roland H. Nelson (1965) Ed.D., Professor of Education

Henry Winston Newson (1948) Ph.D., Professor of Physics

Robert Bruce Nicklas (1965) Ph.D., Associate Professor of Zoology

† Walter McKinley Nielsen (1925) Ph.D., James B. Duke Professor of Physics

"Holger O. V. Nygard (1960) Ph.D., Professor of English

Walter D. Obrist (1956) Ph.D., Assistant Professor of Psychology

Henry John Oosting (1932) Ph.D., Professor of Botany

J. G. Osborne (1961) B.S., Professor of Forestry

Suydam Osterhout (1959) Ph.D., Associate Professor of Microbiology Athos Ottolenghi (1959) M.D., Associate Professor of Physiology and Pharmacology

Harry Ashton Owen, Jr. (1951) Ph.D., Professor of Electrical Engineering Richard A. Palmer (1966) Ph.D., Assistant Professor of Chemistry

Harold Talbot Parker (1939) Ph.D., Professor of History

Joel Francis Paschal (1954) Ph.D., Professor of Law

Merrill Lee Patrick (1964) Ph.D., Assistant Professor of Mathematics Ransom Rathbone Patrick (1954) M.F.A., Ph.D., Professor of Aesthetics and Art

Lewis Patton (1926) Ph.D., Professor of English William Bernard Peach (1951) Ph.D., Professor of Philosophy George Wilbur Pearsall (1964) Sc.D., Professor of Mechanical Engineering

^{*}Absent on Sabbatical Leave, 1966-67. Absent on Leave, 1966-67.

^{††} Retired, August 31, 1966.

Talmage Lee Peele (1939) M.D., Professor of Anatomy
Harold Sanford Perry (1932) Ph.D., Professor of Botany
Anton Peterlin (1962) Ph.D., Adjunct Professor of Chemistry
Ray C. Petry (1937) Ph.D., LL.D., James B. Duke Professor of Church History

Olan Lee Petty (1952) Ph.D., Professor of Education Leland R. Phelps (1961) Ph.D., Professor of German Jane Philpott (1951) Ph.D., Associate Professor of Botany Orrin Pilkey (1965) Ph.D., Assistant Professor of Geology

**Theo Clyde Pilkington (1958) Ph.D., Associate Professor of Electrical Engineering

Jacques C. Poirier (1955) Ph.D., Associate Professor of Chemistry W. H. Poteat (1960) B.D., Ph.D., Professor of Christianity and Culture Benjamin Edward Powell (1946) Ph.D., Librarian
*Richard Lionel Predmore (1950) D.M.L., Professor of Romance Lan-

guages

Jack J. Preiss (1959) Ph.D., Associate Professor of Sociology Richard A. Preston (1961) Ph.D., William K. Boyd Professor of History James Ligon Price, Jr. (1952) Ph.D., Professor of Religion Jesse Harris Proctor, Jr. (1958) Ph.D., Professor of Political Science Louis DuBose Quin (1956) Ph.D., Associate Professor of Chemistry Charles William Ralston (1953) Ph.D., Professor of Forest Soils Dale B. J. Randall (1957) Ph.D., Associate Professor of English Robert Stanley Rankin (1927) Ph.D., Professor of Political Science Eugene M. Renkin (1963) Ph.D., Professor of Pharmacology Thomas D. Reynolds (1953) Ph.D., Associate Professor of Mathematics Lawrence Richardson, Jr. (1966) Ph.D., Professor of Classical Studies Robert C. Richardson (1965) M.S., Instructor in Physics Russell Roberson (1963) Ph.D., Assistant Professor of Physics John Henderson Roberts (1931) Ph.D., Professor of Mathematics J. David Robertson (1966) Ph.D., Professor of Anatomy Charles K. Robinson (1961) Ph.D., Assistant Professor of Religion Hugh G. Robinson (1964) Ph.D., Associate Professor of Physics Robert Samuel Rogers (1937) Ph.D., F.A.A.R., Professor of Latin Theodore Ropp (1938) Ph.D., Professor of History Simon Rottenberg (1965) Ph.D., Professor of Economics **William L. Rowe (1963) Ph.D., Associate Professor of Anthropology Donald Francis Roy (1950) Ph.D., Associate Professor of Sociology Mabel F. Rudisill (1948) Ph.D., Associate Professor of Education Ralph Wayne Rundles (1945) Ph.D., M.D., Professor of Medicine and Microbiology

Harvey J. Sage (1964) Ph.D., Assistant Professor of Pathology George Salamon (1966) Ph.D., Assistant Professor of German

* Absent on Leave, 1966-67.

^{**} Absent on Sabbatical Leave, 1966-67.

Herman Salinger (1955) Ph.D., Professor of German John V. Salzano (1956) Ph.D., Associate Professor of Physiology Charles Richard Sanders (1937) Ph.D., Professor of English Lloyd Saville (1946) Ph.D., Professor of Economics John Henry Saylor (1928) Ph.D., Professor of Chemistry Harold Schiffman (1963) Ph.D., Assistant Professor of Psychology Knut Schmidt-Nielsen (1952) Mag.Sc., Dr. Phil., James B. Duke Professor of Physiology in the Department of Zoology Anne Firor Scott (1961) Ph.D., Associate Professor of History William E. Scott (1958) Ph.D., Associate Professor of History *Richard A. Scoville (1961) M.A., Assistant Professor of Mathematics Richard B. Searles (1965) Ph.D., Assistant Professor of Botany Walter E. Sewell (1965) Ph.D., Adjunct Professor of Mathematics Richard Seymour (1958) Ph.D., Associate Professor of German Barry Shmavonian (1958) Ph.D., Lecturer in Psychology Joseph R. Shoenfield (1952) Ph.D., Professor of Mathematics R. Baird Shuman (1962) Ph.D., Associate Professor of Education David L. Singer (1965) Ph.D., Assistant Professor of Psychology Albert G. Smith (1951) M.D., Associate Professor of Pathology D. Moody Smith (1965) Ph.D., Associate Professor of Religion David A. Smith (1962) Ph.D., Assistant Professor of Mathematics David Tillerson Smith (1930) M.D., Litt.D., James B. Duke Professor of Bacteriology Donald S. Smith, II (1961) M.H.A., Assistant Professor of Hospital Administration

Grover C. Smith (1952) Ph.D., Professor of English Joel Smith (1958) Ph.D., Associate Professor of Sociology

Peter Smith (1959) Ph.D., Assistant Professor of Chemistry

Robert Sidney Smith (1932) Ph.D., James B. Duke Professor of Economics

George G. Somjen (1963) M.D., Associate Professor of Physiology Joachim R. Sommer (1957) M.D., Associate Professor of Pathology Robert L. Spaulding (1965) Ph.D., Associate Professor of Education Marshall Spector (1963) Ph.D., Assistant Professor of Philosophy Joseph John Spengler (1934) Ph.D., James B. Duke Professor of Economics

Ram P. Srivastav (1966) Ph.D., Assistant Professor of Mathematics Olaf Stackelberg (1963) Ph.D., Assistant Professor of Mathematics W. J. Stambaugh (1961) Ph.D., Associate Professor of Forestry Vivian T. Stannett (1961) Ph.D., Adjunct Professor of Chemistry Donald J. Stedman (1963) Ph.D., Assistant Professor of Medical Psychology

Unnsteinn Stefansson (1965) Adjunct Professor of Zoology

^{*} Absent on Leave, 1966-67. † Died, June 15, 1966.

Lionel Stevenson (1955) B.Litt. (Oxon.) Ph.D., F.R.S.L., James B. Duke Professor of English

William Franklin Stinespring (1936) Ph.D., Professor of Old Testament and Semitics

Donald E. Stone (1963) Ph.D., Associate Professor of Botany Howard Austin Strobel (1948) Ph.D., Professor of Chemistry ††John Strugnell (1960) M.A., Assistant Professor of Religion

W. A. Stumpf (1948) Ph.D., Professor of Education
Henry L. Sublett, Jr. (1962) Ed.D., Associate Professor of Education
Herbert P. Sullivan (1960) Ph.D., Associate Professor of Religion
John Dennis Sullivan (1959) Ph.D., Associate Professor of Wood Technology

Elizabeth Read Sunderland (1939-42; 1943) Ph.D., Associate Professor of

Art

Louis E. Swanson (1949) A.B., Associate Professor of Hospital Administration

istration
†Charles Tanford (1959) Ph.D., Professor of Biochemistry
*Marcel Tetel (1960) Ph.D., Associate Professor of Romance Languages
Ralph E. Thiers (1960) Ph.D., Professor of Biochemistry
Edgar Tristram Thompson (1935) Ph.D., Professor of Sociology
Larry W. Thompson (1961) Ph.D., Lecturer in Psychology
Edward A. Tiryakian (1965) Ph.D., Associate Professor of Sociology
E. Clifford Toren, Jr. (1961) Ph.D., Assistant Professor of Chemistry
D. C. Tosteson (1961) M.D., Professor of Physiology

James Nardin Truesdale (1930) Ph.D., Professor of Greek
Benjamin Trump (1965) M.D., Associate Professor of Pathology
Vance Tucker (1964) Ph.D., Associate Professor of Zoology

*Arlin Turner (1953) Ph.D., Professor of English

Richard L. Tuthill (1953) Ed.D., Professor of Geography

Charles Rowe Vail (1939) Ph.D., Professor of Electrical Engineering

Mark J. Van Aken (1963) Ph.D., Associate Professor of History

Jacinto J. Vasquez (1963) M.D., Professor of Pathology

F. John Vernberg (1951) Ph.D., Associate Professor of Zoology

John M. Vernon (1966) Ph.D., Assistant Professor of Economics

Aleksandar Sedmak Vesic (1964) D.Sc., Professor of Civil Engineering Patrick R. Vincent (1954) Ph.D., Associate Professor of Romance Languages

Stephen A. Wainwright (1964) Ph.D., Associate Professor of Zoology Salih J. Wakil (1959) Ph.D., Professor of Biochemistry and Nutrition W. H. Wallace (1962) Ph.D., Assistant Professor of Accounting Michael Wallach (1962) Ph.D., Professor of Psychology

†† Resigned, August 31, 1966.

^{*} Absent on Sabbatical Leave, 1966-67.
† Absent on Leave, Fall Semester, 1966.

Richard L. Walter (1962) Ph.D., Assistant Professor of Physics Calvin L. Ward (1952) Ph.D., Associate Professor of Zoology Charles Eugene Ward (1927) Ph.D., Professor of English Bruce W. Wardropper (1962) Ph.D., Professor of Romance Languages Seth L. Warner (1955) Ph.D., Professor of Mathematics Richard Lyness Watson, Jr. (1939) Ph.D., Professor of History Henry Weitz (1950) Ed.D., Associate Professor of Education Richard L. Wells (1962) Ph.D., Assistant Professor of Chemistry Paul Welsh (1948) Ph.D., Professor of Philosophy Robert W. Wheat (1956) Ph.D., Associate Professor of Microbiology Richard A. White (1963) Ph.D., Assistant Professor of Botany Karl Milton Wilbur (1946) Ph.D., James B. Duke Professor of Zoology Robert L. Wilbur (1957) Ph.D., Associate Professor of Botany Pelham Wilder, Jr. (1949) Ph.D., Professor of Chemistry Mrs. Hilda Pope Willett (1948) Ph.D., Professor of Bacteriology G. Trevor Williams (1965) Sc.D., Associate Professor of Mathematics George W. Williams (1957) Ph.D., Associate Professor of English Robert Marshall Williamson (1951) Ph.D., Associate Professor of Physics A. Leslie Wilson (1961) Ph.D., Associate Professor of German Neil L. Wilson (1957) Ph.D., Professor of Philosophy Robert Renbert Wilson (1925) Ph.D., LL.D., James B. Duke Professor of Political Science Thomas George Wilson (1959) Sc.D., Professor of Electrical Engineering Cliff W. Wing, Jr. (1965) Ph.D., Associate Professor of Psychology Manfred Winnewisser (1963) Ph.D., Instructor in Physics H. H. Winsborough (1962) Ph.D., Associate Professor of Sociology Orval S. Wintermute (1958) Ph.D., Associate Professor in Religion Benjamin Wittels (1961) M.D., Associate Professor of Pathology Thomas Wonnacott (1965) Ph.D., Assistant Professor of Mathematics ††Donald J. Wood (1962) Ph.D., Assistant Professor of Civil Engineering Max A. Woodbury (1966) Ph.D., Professor of Mathematics Frank Wilson Woods (1958) Ph.D., Associate Professor of Forest Ecology Robert Hilliard Woody (1929) Ph.D., Professor of History William P. Yohe (1958) Ph.D., Professor of Economics James G. Yoho (1957) Ph.D., Professor of Forest Economics Charles R. Young (1954) Ph.D., Associate Professor of History

Visiting Professors

Alois Arnoldner (1966) Ph.D., Visiting Lecturer in German Raymond W. Beachey (1966) Ph.D., Visiting Professor of History Milan S. Djordjevic (1964) Ph.D., Visiting Professor of Mechanical Engineering

Chester M. Zmijewski (1963) Ph.D., Associate Professor of Immunology

†† Resigned, August 31, 1966.

Sudhir Kumar (1958) Ph.D., Visiting Associate Professor of Civil Engineering

Emeritus Professors

Lucius Aurelius Bigelow (1929) Ph.D., Professor Emeritus of Chemistry Juan R. Castellano (1947) D.F.L., Professor Emeritus of Romance Languages

Benjamin Guy Childs (1924) M.A., Professor Emeritus of Education

Frederick A. G. Cowper (1918) Ph.D. Professor Emeritus of Romance Languages

George Sharp Eadie (1930) Ph.D., Professor Emeritus of Physiology and

Pharmacology

Howard Easley (1930) Ph.D., Associate Professor Emeritus of Education Allan H. Gilbert (1920) Ph.D., Professor Emeritus of English

Paul M. Gross (1919) Ph.D., William Howell Pegram Professor Emeritus of Chemistry

Frank Gregory Hall (1926-42; 1945), Professor Emeritus of Physiology

and Pharmacology

George Thomas Hargitt (1930) Ph.D., Sc.D., Professor Emeritus of Zoology

Charles Cleveland Hatley (1917) Ph.D., Professor Emeritus of Physics Duncan Charteris Hetherington (1930) Ph.D., M.C., Professor Emeritus of Anatomy

Jay Broadus Hubbell (1927) Ph.D., Professor Emeritus of English
William H. Irving (1936) B.A. (Oxon.) Ph.D., Professor Emeritus of

Engusn

Howard Eikenberry Jensen (1931) Ph.D., Professor Emeritus of Sociology Brady Rimbey Jordan (1927) Ph.D., Professor Emeritus of Romance Languages

Clarence Ferdinand Korstian (1930) Ph.D., Professor Emeritus of Silvi-

culture

William Thomas Laprade (1909) Ph.D., Professor Emeritus of History Charles Earl Landon (1926) Ph.D., Professor Emeritus of Economics Ernest William Nelson (1926) Ph.D., Professor Emeritus of History Walter McKinley Nielsen (1925) Ph.D., James B. Duke Professor

Emeritus of Physics

Robert Leet Patterson (1945) Ph.D., Professor Emeritus of Philosophy H. Shelton Smith (1931) Ph.D., James B. Duke Professor Emeritus of Religion

Hersey Everett Spence (1918) Professor Emeritus of Religious Education Hertha D. E. Sponer (1935) Ph.D., Professor Emeritus of Physics Clement Vollmer (1926) Ph.D., Professor Emeritus of German

†Herbert von Beckerath (1935) Ph.D., Professor Emeritus of Economics and Political Science

† Died, March 11, 1966.

Warren Chase Vosburgh (1928) Ph.D., Professor Emeritus of Chemistry Loring Baker Walton (1929) Lic. es L. Ph.D., Professor Emeritus of Romance Languages

Alban Gregory Widgery (1930) M.A., Professor Emeritus of Philosophy James Wesley Williams (1937) M.S., Professor Emeritus of Civil Engi-

neering

Frederick Adolphus Wolf (1927) Ph.D., James B. Duke Professor Emeritus of Botany



General Information

The Duke University Graduate School

In surveying the progress made in the first seven years after the founding of Duke University, its first President, William Preston Few, wrote that he wanted "to see the Graduate School made strong because it will best and most quickly insure our attaining and maintaining a place of real leadership in the educational world . . . more than anything else here our Graduate School will determine the sort of University we are to build and its standing in the educational world." These opinions have continued to prevail to the present day, with emphasis upon the interdependence of teaching and research as the necessary components of scholarship.

Four hundred members of the graduate faculty teach the approximately five hundred courses and seminars offered in the Graduate School, and supervise thesis and dissertation research. Many of the major universities of the world have helped to train this faculty; approximately 90 per cent of the graduate staff hold degrees from the forty-one institutions which make up the Association of Graduate Schools within the Association of American Universities. By place of birth they represent almost every

state in the Union and almost two dozen foreign countries.

The fifteen hundred graduate students currently enrolled represent a similar diversity in background. Approximately 48 per cent of students recently completing degrees are from undergraduate colleges in the

Southeast, 18 per cent are from the Middle Atlantic states, 11 per cent from the Central states, 10 per cent from New England, 3 per cent from the Far West, 1 per cent from the Southwest, 1 per cent from the Northwest, and 8 per cent from foreign countries. The old maxim that a university is only as good as its faculty might be amended by adding "and no better than its student body." No professor can give his wisdom to a student, and no student can take his understanding from another. This must be a reciprocal process between professor and student, and between student and student. The groundwork for learning may be laid in privacy-indeed a certain amount of private study and research is absolutely essential—but the vital stimulus to the learning process comes from one's contact with the minds of other men with similar or related interests. This is precisely why graduate schools are highly selective in their admissions policy, and it is one of the important reasons why they are willing to offer attractive fellowship awards to outstanding students. The superior student is a valuable catalyst both for his fellow students and for his faculty, and is prized as such.

Faculty and students comprise the essential human factors in education, but their joint endeavor cannot prosper without adequate research and library facilities. Duke University is particularly fortunate in regard to research facilities, for the physics, botany, zoology, psychology, engineering and biochemistry laboratories have been entirely built within the last sixteen years, and modernization and expansion have occurred in other scientific areas. It is also the University's pride that it has one of the finest research libraries, the nineteenth largest university library in the nation today, second in the South, and first in the Southeast. In number of volumes, breadth of coverage, serials, and documents, it is a much more adequate library than that available in many graduate schools with enrollment two or three times as large. To the student in the arts, humanities, and social sciences, for whom the library is the bloodstream of scholarship, this is an immeasurable asset.

Among the many special features of the Graduate School may be mentioned a few of importance to various graduate programs. For students in the biological sciences, the facilities of the Duke Marine Laboratory at Beaufort, North Carolina, are available for course work and research. The Laboratory has research buildings, class rooms, motor vessels, including the 118-foot oceanographic ship, the R/V Eastward, and living quarters which make it one of the best research centers in marine biology in the country. Closer to home are the seven thousand acres of the Duke Forest, managed by the School of Forestry, ideal for research on timber growth, soils and related topics. A large phytotron is under construction. Students in both the physical and the life sciences frequently avail themselves of the facilities of the Oak Ridge Institute of Nuclear Studies, of which Duke is one of the sponsoring universities.

In the social sciences the Commonwealth-Studies Center is inter-

nationally recognized for its graduate training and research program. It is today one of the major centers, from the point of view of both faculty and library resources, carrying on studies of the various areas of the British Commonwealth. The Center is a cooperative enterprise of the Political Science, Economics, and History departments. Other important graduate programs with an international orientation focus on Europe, South Asia, Sub-Sahara Africa, and South America.

Other special teaching or research programs include the Lilly Endowment program in Christianity and the social order, jointly conducted by the departments of Political Science and Religion; the Ford Foundationsponsored program in gerontology, conducted by the departments of Sociology and Economics; a joint program in the anatomical, physiological and psychological aspects of behavior with support under the National Defense Education Act; a research workshop on economic development for advanced students; and numerous others such as the Cooperative Programs with the University of North Carolina in the Humanities and in Slavic Studies. Duke is also fortunate in having excellent Medical, Law, Forestry, and Divinity Schools on its main campus, thus making many additional facilities available for course or research work related to the graduate curricula in the arts and sciences. A two-term Summer Session and the availability of courses in the nearby University of North Carolina under a cooperative arrangement offer other opportunities to the graduate student.

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No description of programs can begin to give the prospective student the full flavor of graduate study in a particular institution. A visit to the universities one is particularly interested in may be helpful in giving one a better picture. If this should be practical, the Duke Graduate School offers a warm invitation to prospective students to come to the campus during the year to discuss their possible application and admission. The visitor will find at Duke most of the facilities that one could hope for in the largest of institutions, and yet the University has been fortunate in avoiding many of the evils inevitable with mass education. Despite the total University enrollment of approximately 7,200, Duke has retained the sense of community that one usually associates with a smaller liberal arts college. And in an age when current architectural whim often adds yet one more variant style to an already assorted array of buildings, Duke has built with foresight and design a campus of unusual beauty. This, too, is an important part of the fabric of education, creating an environment conducive to learning.

Courses of Study and Requirements for Degrees

The Graduate School of Arts and Sciences now offers the following degrees: Master of Arts (A.M.), Master of Science (M.S.), Master of Education (M.Ed.), Master of Arts in Teaching (M.A.T.), Master of Hospital Administration (M.H.A.), Doctor of Philosophy (Ph.D.), and the Doctor of Education (Ed.D.).

The Master's Degree

To be considered as a candidate for a Master's degree (A.M., M.S., M.Ed., M.A.T., M.H.A.), the graduate student must (1) have made passing grades in the first 12 units of course work, (2) have made a grade of G or E on at least 3 units of this work, and (3) have received the approval of the major department (or in the case of the M.A.T., of the supervisory committee).

Residence Requirements

Candidates for all Master's degrees must spend, as a *minimum*, one full academic year, or its equivalent in Summer Session terms, in residence at Duke University. (See p. 51.) Those who wish to complete

their degrees wholly in the Summer Session must be in residence for five terms. Often more time will prove necessary in either case, depending upon the nature of the student's research problem if a thesis is offered and upon the student himself.

Transfer of Graduate Credits

Under certain circumstances a maximum credit of 6 units may be allowed for graduate courses completed elsewhere. The acceptance of credit up to this amount, however, will not reduce the minimum of

required registration at Duke University. (See p. 51.)

With the approval of both the student's major department and the Dean of the Graduate School, a student who is granted such transfer credit may be permitted to register for as much as 12 units of thesis research instead of the usual 6 units. Or he may be permitted to fill out his schedule with as much as 6 units of further undergraduate training or 6 units of required language courses on the undergraduate level. In no case will credit be allowed for extension or correspondence courses.

Time Limits for Completion of Master's Degrees

The candidate for the Master's degree who is in residence for consecutive academic years should complete all requirements for the degree within two calendar years from the date of his first registration in the Graduate School. Any candidate must complete all requirements within

six calendar years of his first registration.

To be awarded a degree in June the student must have completed all requirements, including the recording of transfer credit, by the last day of the final examination period. If a thesis is one of the requirements, it must be submitted to the Graduate Office by May 1. To be awarded a degree in September, the student must complete all requirements, except the recording of transfer credit, by the last day of the Summer Session. Any transfer credit must be recorded by September 15. The thesis must be submitted to the Graduate Office by August 15. If requirements are not completed by the indicated dates, the degree will be awarded in the following June or September.

The Thesis

The thesis should demonstrate the student's ability to collect, arrange, interpret, and report pertinent material on his special research problem. Although a publishable document is not required, the thesis must be written in an acceptable style and should exhibit the student's competence in scholarly procedures. Requirements of form are set forth in the Duke University Manual of Style for Theses and Dissertations, revised 1961, obtainable at the Duke University Book Store.

Master of Arts

Prerequisites

As prerequisites to graduate study in his major subject, the student must have completed a *minimum* of 12 semester hours of approved college courses in that subject, and 12 additional semester hours in that subject or in related work. Since some departments require more than 12 semester hours, the student should read carefully the special requirements listed by his major department, which are included as headnotes to the course offerings in this bulletin.

Language Requirements

The candidate for the A.M. degree must have a reading knowledge of at least one ancient or modern foreign language. (The several departments reserve the right to specify which foreign languages are acceptable.) For methods of satisfying language requirements see p. 54. The language requirement must be satisfied before the Master's examination is taken.

Major and Minor Subject

In his graduate work the student must present acceptable grades for a minimum of 24 units of graduate courses. Of these, at least 12 units must be in the major subject. The student must take a minimum of 6 units in a minor subject or related fields which are approved by his major department. The remaining 6 units of the required 24 may be taken in either the major or minor department, or in another approved by the major department and by the Dean of the Graduate School. In addition he must present a thesis, which carries a credit of 6 units for which he must register. Thus, his earned credit for the degree totals a minimum of 30 units.

The Thesis

Filing the Thesis Title. At least one month before presenting the thesis, that is on or before March 1 for a June degree or on or before July 1 for a September degree, the student must file with the Dean of the Graduate School, on the official form, the title of the thesis and declaration of intention to graduate. The title must have the approval of the Director of Graduate Studies in the major department, and of the thesis supervisor.

Preparing the Thesis. All basic requirements for preparing the thesis are described in the Manual of Style for Theses and Dissertations, revised 1961, obtained at the Duke University Book Store, West Campus. The quality of paper, form, and binding are prescribed in the Manual.

Submitting the Thesis. Four typewritten copies of the thesis bound in snap binders supplied by the Library must be submitted in approved form to the Dean of the Graduate School on or before May 1 for a June degree or August 15 for a September degree and at least three days before the scheduled date of the student's examination. The copies will then be distributed to the several members of the examining committee. Two copies for the Library will be bound by the Ruzicka Bindery, fee \$5.00 a volume. The student will state whether or not he wishes more than two so bound.

The Examining Committee and the Examination

The instructor who directs the thesis appoints an examining committee composed of the supervisor of the thesis and two other members of the Graduate Faculty, one of whom must be from a department other than that of the major. If the student has been permitted to take related work within the major department, the third member may represent the minor field within the department. This committee is submitted for approval to the Dean of the Graduate School when the thesis is first presented.

The candidate appears before this committee for an examination which lasts for about one and one-half hours. The subject matter covered in the examination is usually restricted to the thesis and to the major field.

If the candidate passes his examination, the examining committee certifies this fact by signing the title page of all copies of the thesis. The candidate then returns the original, the first carbon copy of the thesis, and any others he wishes bound by Ruzicka, to the Dean of the Graduate School, who deposits them in the University Library.

Master of Science

The degree of Master of Science is offered in the three fields of Engineering-Civil, Electrical, and Mechanical-and in Forestry.

Prerequisites—Engineering

As prerequisites to this degree, the student must have earned a Bachelor's degree from an accredited engineering college and have completed a minimum of 12 semester hours work in the major field.

Prerequisites—Forestry

As prerequisite to this degree, the student must have earned a Bachelor's degree which represents an undergraduate program in forestry or an allied field.

Language Requirements

For the Master of Science degree no foreign language is required.

Major and Minor Subjects-Engineering

The work for the Master of Science degree is designed to provide a broad foundation in the fields of civil, electrical, and mechanical engineering. The student must present acceptable grades for a minimum of 24 units of graduate courses: at least 12 in course work in his major area of concentration in engineering (not necessarily confined to the offerings of the engineering department in which the student is registered); a minimum of 6 units in a minor subject outside of engineering which lends broad support to his program (usually in mathematical or natural sciences); and the remaining 6 of the 24-unit course requirement in either the major or minor subject, or in an area approved by the major department and by the Dean of the School of Engineering. In addition to the 24-unit course requirement, the student must present a thesis, which carries a credit of 6 units. Thus his earned credit for the degree totals a minimum of 30 units.

Major and Minor Subjects-Forestry

The work for the Master of Science degree is designed to provide a broad foundation in forestry and allied fields. Course requirements are 12 units in forestry, a minimum of 6 units in a minor field outside of forestry, and the remaining 6 units in either the major or the minor field, or in another area approved by the Director of Graduate Studies in Forestry and by the Dean of the Graduate School. In addition to the 24-unit course requirement, the student must present a thesis which carries 6 units of credit. Thus his earned credit for the degree totals a minimum of 30 units.

Thesis and Examination

The regulations and procedures for the thesis and the provisions for examination and an examining committee are the same as those for the Master of Arts degree.

Master of Education

Prerequisites

Before a student is admitted to graduate study for this degree, he should have completed, on the undergraduate level, a minimum of 18 semester hours of approved work in Education.

Before the degree is conferred the student must have had one year of actual teaching experience, or have met certification requirements by supervised student teaching in an accredited school. Such supervised student teaching may be at either the undergraduate or the graduate level.

The Thesis

The Master of Education degree may be earned either with or without the presentation of a thesis.

Without thesis. The required work includes a departmental major (Administration, Counseling, Elementary Education, Secondary Education, or Teaching the Emotionally Disturbed) of at least 12 units, and a minor of at least 6 units outside the Department of Education. The remaining 12 units are elective within the area of Education and the minor field, but require the approval of the student's major adviser and the Director of Graduate Studies.

Toward the end of his residence the student must pass a comprehensive examination on his departmental major. This examination shall be prepared and conducted by the instructors of the student's major as designated by the Director of Graduate Studies of the Department of Education. Request to take this examination should be made to the Director of Graduate Studies at least two weeks before the date on which the examination is to be conducted.

With thesis. Students who elect this plan are permitted to substitute a thesis for 6 units for the required course work. The thesis subject must be approved by the instructor who is to direct it, and by the Director of Graduate Studies.

In addition to the thesis, the student must present at least 24 units of course credit. Of these, 12 units must be taken in the student's departmental major. Six units, constituting a minor, must be taken outside of the Department of Education. The remaining 6 units are elective within the area of Education and the minor field, but require the approval of the student's major advisor and the Director of Graduate Studies.

The regulations governing the thesis are the same as those for the Master of Arts degree.

Recommendation for Teacher Certification

Elementary school teachers who already hold certificates and who desire the recommendation of Duke University for a graduate teaching certificate must include in their Master's program a minimum of 12 semester hours in subjects ordinarily taught in elementary school and 12 semester hours in courses in education designed to improve them as elementary school teachers.

Master of Arts in Teaching

Prerequisites

The degree of Master of Arts in Teaching is designed for teachers already in service and for recent graduates of liberal arts colleges who wish to enter public school, private school, or junior college teaching.

A student should normally have completed a minimum of 12 semester hours in his proposed major subject and an additional 12 semester hours in that or related subjects. Should a student wish to undertake a graduate major different from his undergraduate major, the prerequisites may be modified upon the recommendation of the student's committee and the approval of the Dean of the Graduate School.

Programs for the Degree

Either of two programs may be arranged, in consultation with the student's committee:

1. A major in Education of 18 to 24 units and 6 to 12 units in non-education courses (for students seeking certification).

2. A major in non-education courses of 18 to 24 units and 6 to 12 units in Education (for students already certified).

In both programs a minimum of 30 units is required.

The non-education courses are to be taken in one or more subjects ordinarily taught in the secondary schools. The amount and distribution of this work will be determined by the needs of the individual student. A major in Biological Sciences or in Physical Sciences is possible in this program. Teachers who have already completed certification requirements must major in a teaching field in their Master of Arts in Teaching program. Students who have not completed certification requirements are expected to major in education.

The Master of Arts in Teaching may be earned with or without the presentation of a thesis. If a student, in consultation with his committee, elects to present a thesis, 6 units of the total of 30 units required will be allotted to thesis research. He will then be required to complete 24 units of course credits. The regulations governing the thesis are the same as those for the A.M. (see p. 6). Candidates for the Master of Arts in Teaching who have not had teaching experience are required to take Education 215-216 in which case a minimum of 36 units is required.

The Committee

Each candidate for the degree will be assigned a committee, appointed by the Director of Graduate Studies in the major department or area. This committee will consist of three members, at least one of whom will be from the Department of Education, and at least one from another department. The chairman of the committee will normally be chosen from the department of the major.

Recommendation for Teacher Certification

Secondary school teachers who already hold certificates and desire the recommendation of Duke University for graduate teaching certificates must include in their Master's program a minimum of 18 semester hours in their teaching fields and 6 semester hours in courses in education designed to improve them as secondary school teachers.

Master of Hospital Administration

Prerequisites

The Master of Hospital Administration degree is designed for persons intending to pursue a career of management in hospitals and other health agencies.

No specific undergraduate major is required for participation in graduate studies leading to this degree, but certain courses are prerequisites:

- 2 semesters of natural sciences
- 2 semesters of economics or political science, or 1 semester of each
- 2 semesters of psychology or sociology, or 1 semester of each
- 2 semesters of accounting, either basic or managerial

In selected cases, students who have not completed all prerequisites may be admitted on a conditional basis subject to completion of deficiencies while completing other requirements of the degree program.

Program for the Degree

The program for this degree includes 36 graduate units, of which 18 are in courses in Hospital Administration and 18 are in designated courses in

Economics, Political Science, and Sociology.

Completion of this program ordinarily requires 24 months. Included is a 12-month administrative residency which is conducted under faculty supervision in hospitals and other health agencies within commuting distance of the University campus. A portion of the residency is devoted to preparation and presentation of a written management study.

Comprehensive Examination

Successful completion of a comprehensive examination, consisting of both oral and written phases, is a prerequisite qualification for the M.H.A. degree.

Doctor of Philosophy

The Ph.D. degree is essentially a research degree. Although course work is a necessary part of the student's program, the mere accumulation of course credits will not be sufficient for attaining this degree. The granting of the Ph.D. is based primarily upon the student's knowledge of a specialized field of study and upon the production of an acceptable dissertation embodying the results of original research.

Requirements for the Ph.D. Degree

The formal requirements, discussed in detail below, for the Ph.D. degree are as follows: (1) foreign languages; (2) major and minor courses; (3) supervisory committee for program of study; (4) residence; (5) preliminary examination; (6) dissertation; (7) final examination. In order to be considered for candidacy for the Ph.D. degree, the student must have passed all of his course work in the first year of graduate study; on at least 9 units of course work he must have made a grade of G or better.

Foreign Languages

A reading knowledge of two acceptable foreign languages is required. (For acceptable languages and methods of meeting this requirement, see

p. 54.)

A student working toward the doctoral degree should complete the language requirements for that degree by the end of his first year of residence. If he fails to meet these requirements by the end of his third semester of residence, he must register in the appropriate special reading course or courses (see page 56) until he has satisfied the requirements.

The foreign language requirement must be met before preliminary

examinations are taken.

Major or Minor

The student's program of study necessarily demands substantial concentration on courses in his major department. It must, however, include a minimum of six units in a minor subject or related fields approved by his major department. Use of related fields within the major department requires the approval of the Dean of the Graduate School.

Committee to Supervise the Program of Study

As early in a student's course of study as is practicable and not later than two months before the preliminary examination the Director of Grad-

uate Studies in the major department will nominate for the approval of the Dean a supervising committee of five, one being designated as chairman. This committee will include at least three members of the major department and one from the minor if a minor is involved. This committee will draw up a program of study and administer the preliminary examination and, with such necessary changes as are approved, the final doctoral examination. However, should all members of the committee be from the major department, at least one member of another department will be added or substituted for the final doctoral examination. The final examination may be administered with a minimum of four members.

When the preliminary examination is arranged, the committee and the Director will submit to the Dean the student's program of study bearing a statement that the Department's course and language requirements

have been or are being completed.

Residence

For students who first registered in September 1959 or thereafter the minimum registration requirement is 60 units of graduate credit not more than 30 units of which may be accepted by transfer. Since a full program is 30 units per academic year, the prospective Ph.D. candidate who enters with the A.B. or B.S. degree must plan to spend in residence a minimum of two academic years; if he enters with the A.M., his minimum residence is one academic year. (For the definition of residence, see page 51.) If there are undergraduate deficiencies in his program, he may in addition to the minimum requirements be required to take preliminary undergraduate courses for which he will not receive graduate credit. Even if there are no such undergraduate deficiencies, the student's supervisory committee will determine what requirements if any above the minimum the student must meet.

Credit for Summer Work. Credit earned in the Summer Session will not reduce the minimum required residence (see p. 51).

Time Limitations

1. At the time that the preliminary examination is passed any courses, language certifications, or other credits for advanced standing which are more than six calendar years old will not be accepted toward fulfilling

the minimum requirements of the doctoral degree.

2. The student should normally pass the preliminary examination by the end of his second year of graduate study. If he has not passed it by the middle of the third year, he must file with the Dean of the Graduate School a statement explaining the delay and setting a date for the examination. Except under unusual circumstances, extension will not be granted beyond the end of the third year.

3. The doctoral dissertation should be submitted and accepted within two calendar years after the preliminary examination is passed. Should the dissertation not be submitted and accepted within four years after the examination, the candidate, with the approval of his committee, may petition the Dean of the Graduate School for an extension of one year. Should this extension be granted and the dissertation not be submitted and accepted within the year, the student to remain a candidate for the degree must pass a second preliminary examination. In such a case, the time limit for submitting the dissertation will be determined by the Dean of the Graduate School and the candidate's committee.

Preliminary Examination

A student is not accepted as a candidate for the Ph.D. degree until he has passed the preliminary examination. A transfer student who may have passed a preliminary examination elsewhere must nevertheless take the examination in this Graduate School. The examination ordinarily covers both the major and minor fields.

In the summer, a preliminary examination may be scheduled only

between the opening and closing dates of the Summer Session.

Privilege of Re-Examination. Should the student fail the preliminary examination, he may apply, with the consent of his supervisory committee and of the Dean of the Graduate School, for the privilege of a second examination to be taken no sooner than three months after the date of the first. Failure on the second examination will render the student ineligible to continue his program for the Ph.D. degree at Duke University.

Reduction in Registration. Because the student who passes the preliminary examination is eligible for a reduction in required registration, he should assume responsibility for prompt notification of the decision to the

Graduate School Office.

The Dissertation

The dissertation is expected to be a mature and competent piece of writing, embodying the results of significant and original research.

Filing Title. Not later than March 1 (March 2 if March 1 falls on Sunday) preceding the June commencement at which the degree is expected to be conferred, the student must file with the Dean of the Graduate School, on the official form to be obtained from the Graduate Office, the title of the dissertation. This title must receive the written approval of both the Director of Graduate Studies of the student's major department and the professor who directs the dissertation.

Form. The basic requirements for preparing the dissertation such as quality of paper, form, and binding are prescribed in the instructions for microfilming (see below) and in the Manual of Style for Theses and Dis-

sertations, revised 1961, to be obtained from the Duke University Book

Store, West Campus.

Submitting Dissertation. The dissertation must be completed to the satisfaction of the instructor who directs it. Four typewritten copies bound in snap binders obtained in the Library must be deposited with the Dean of the Graduate School on or before April 15 preceding the June commencement when the degree is to be conferred. The dissertation must be submitted to the Graduate Office at least seven days before the scheduled date of the student's examination.

Publication on Microfilm. All doctoral dissertations will normally be published on microfilm through University Microfilms, Ann Arbor, Michigan. Authors may, if they wish, also copyright them. The abstract will be published in Dissertation Abstracts. Before final typing is completed, the candidate should obtain in the Graduate Office detailed instructions on the

procedure and the microfilming agreement.

In brief, all copies of the dissertation, the original in clean type, will remain unbound except for spring binders. Ten copies of an abstract, carefully written and not more than 600 words long, are submitted when the dissertation is first presented to the Graduate Office. A non-returnable dissertation fee of \$25 is charged for handling and microfilming. If copyright is desired, an additional fee is charged of \$6 plus 2½ cents per page. The original copy and first carbon copy will be bound by the Ruzicka Bindery. The fee is \$5.00 a volume. The student may request that more than the two copies be so bound.

Final Examination

The final oral examination shall be primarily on the dissertation. Questions may, however, be asked in the candidate's major field. Except in unusual circumstances approved by the Dean a final examination will not be scheduled between the last day of the spring examination period

and registration day in the fall semester.

If a student fails his final examination, he may be allowed to take it for a second time, but not sooner than six months from the date of his first. Permission to take the second examination must be obtained from the instructor who directed the dissertation and from the Dean of the Graduate School. Failure to pass the second examination renders the student ineligible to continue work for the Ph.D. degree at Duke University.

Deposit of the Dissertation

After the examination has been passed, the candidate brings to the Graduate Office the original and first carbon copies of the dissertation, properly signed, and any other copies he wishes bound by Ruzicka. At this time he signs the microfilming agreement and pays such binding and copyright fees as are due.

Doctor of Education

The Doctor of Education degree is a professional degree planned for those who are, or intend to become, school administrators, supervisors, directors of instruction, curriculum consultants, college teachers of education, or other professional personnel.

Requirements for the Ed.D. Degree

The candidate for the Ed.D. degree must meet the same requirements as the candidate for the Ph.D. degree. In addition to these uniform requirements, the candidate for the Ed.D. (1) must have had at least two years' experience in educational work; (2) must present strong letters of appraisal and recommendation from persons well qualified to speak with authority of his abilities; and (3) must present himself, if possible, for a personal interview. The Standing Committee on the Ed.D. degree reserves the right to insist upon an interview.

Persons who are primarily concerned with meeting requirements set by North Carolina for the advanced certificate for principals and supervisors must request and secure admission for doctoral study.

Residence Requirements

Regulations concerning residence requirements, grades required during the first year of graduate study, and the preliminary examination are the same as those for the Ph.D. (See pp. 12-15.)

Foreign Languages

There are no foreign language requirements for the Ed.D. degree.

Program of Work

The candidate for the Ed.D. degree will choose as his major field either Educational Administration and Supervision or Curriculum and Instruction.

Candidates in Administration and Supervision will take approximately 24 units in that field, including the seminar in School Administration. In addition, they will take approximately 18 units in other professional courses, and a minor of approximately 18 units approved by the candidate's supervisory committee and the Standing Committee on the Ed.D. degree.

Candidates in Curriculum and Instruction will take approximately 24 units in Curriculum and Instruction. In addition, they will take approximately 12 units in other professional courses, and a minor of approxi-

mately 24 units in the humanities, the natural sciences, or the social sciences, exclusive of professional education.

The program of work for each candidate must be approved by the

Standing Committee for the Ed.D. degree.

Dissertation

The candidate must write a dissertation, for which the formalities of presentation, including its defense in a final examination, are the same as those for the Ph.D. degree. The type of dissertation will depend upon which of the following plans the candidate adopts:

Plan A. A candidate choosing Plan A will write a dissertation which is expected to be a mature and competent piece of writing, embodying the results of significant and original research. It must be, in essence, a

contribution to knowledge.

Plan B. A candidate choosing Plan B will serve at least a year in an administrative post, or a teaching position in an elementary or secondary school, subsequent to the completion of all course requirements and a year of residence. His dissertation may be concerned with a problem, or several closely related problems, growing out of this experience. Although the dissertation written under Plan B is of a practical nature, it must demonstrate the candidate's ability to investigate and report on a significant phase of education in his major field.

Publication on Microfilm. The dissertation will be published on micro-

film, as is the dissertation for the Ph.D. (See p. 15.)

Final Examination

Regulations for the final examination are identical with those of the Ph.D. degree. (See p. 15.)

Special and Cooperative Programs

Program in Comparative Studies on Southern Asia

The Program in Comparative Studies on Southern Asia was established at Duke University in 1961 following a grant from the Ford Foundation to the Commonwealth-Studies Center to enable it to develop a research and training program on that area. In 1961 the university entered into a contract with the United States Office of Education and sponsored a South Asian Language Training and Area Center under the provisions of Title VI of the National Defense Act. The basic purpose of this program is twofold: to facilitate research on the political, historical, economic and socio-cultural development of Commonwealth countries for Southern Asia (India, Pakistan, Ceylon, Malaysia and Singapore) and to provide for the systematic training of graduate students in economics, history, political science, and sociology-anthropology with special emphasis on the area.

The graduate student, in addition to meeting the requirements of the department in which he is enrolled, is expected to take Hindi-Urdu or another major South Asian language, the cognate courses in other departments and to undertake field research in the preparation of his dissertation.

The Program awards each year a limited number of pre-doctoral fellow-

ships for graduate studies in the discipline and under the expectations listed above. Awards carrying the same expectations are also made under the NDEA Title VI language fellowships offered by the United States Office of Education.

Facilitation and support of research activities by members of the Duke University faculty and graduate students is an important aspect of the Program's activities. It supports through travel grants and subsistence allowances field research by persons affiliated with the University. Research grants for faculty and students are also available from the American Institute of Indian Studies and the United States Office of Education. Research facilities include those materials received as a result of the University's participation in a library acquisitions program under the terms of Public law 480.

The Program has undertaken the publication of three series: hard-cover monographs, reprints of articles of note dealing with the Southern Asian region and a series of occasional papers. Inquiries should be addressed to the Executive Secretary, Program in Comparative Studies on Southern

Asia, Duke University, Durham, North Carolina.

Hispanic Studies Program

The Graduate School offers an inter-departmental program of Hispanic studies leading to the A.M. and Ph.D. degrees. Students may write their theses and take their degrees in history, economics, political science, sociology, and Hispanic languages and literatures. The purpose of the program is to make possible desirable combinations of courses on the Hispanic world in these related disciplines and to bring to bear more strength of the faculty upon the training of a single candidate. This may be achieved through a judicious use of minors or by such special arrangements as may from time to time become necessary.

The Duke University Library holdings have been built up to facilitate graduate work and research in Hispanic-American cultural history, inter-American relations, economic history, politics, and Spanish-American

literature. These collections are being constantly enlarged.

The Population Studies Program

The Population Studies Program at Duke University was established in 1963 as a joint enterprise of the Departments of Economics and Sociology and was charged with both educational and research functions in the area of Demography and Human Ecology.

Training under the auspices of the Program leads to a Ph.D. degree within the Departments of Sociology or Economics with a specialization in Population Studies. Two training programs are available, one in each department. Each is designed to provide an integrated and cross-disciplinary training in the common speciality area of Population Studies.

In addition to cross-departmental courses, program unity is produced through a Population Studies Seminar. This Seminar, which is non-credit and informal, is attended by advanced students and by faculty in both departments. The Seminar provides briefing on demographic research conducted by both faculty and students in the two departments. It also serves as a vehicle for a number of visiting lecturers in demography each semester.

Graduate fellowships for students in the Program are available in either of the two departments.

The Center for Southern Studies

The Center for Southern Studies in the Social Sciences and the Humanities at Duke University was formally opened July 1, 1965. It is not a degree granting agency, but both the M.A. and the Ph.D. degree with a Southern area orientation may be earned through most of the departments associated with the Center. These are History, Economics, Political Science, Sociology and Anthropology, English, Education, and Religion. The general goal of the Center is the integration and promotion of human knowledge about the South in the areas represented by the associated departments. To this end the Center has formulated a program which includes public lectures, seminars, symposia, publication, travel, visiting lectureships, pre-doctoral and post-doctoral fellowships.

Oak Ridge Institute of Nuclear Studies

Duke University is one of the sponsoring universities of the Oak Ridge Institute of Nuclear Studies located at Oak Ridge, Tennessee. The graduate research program at Duke has available to it all the facilities of the Oak Ridge National Laboratory and the cooperative supervision of student research by the staff at Oak Ridge.

Fellowships in several fields of science are available to qualified ap-

plicants.

Graduate Fellowship Program. On application by a university the Institute awards fellowships to candidates for the master's and doctor's degree. The student uses the fellowship to conduct his thesis research in an Oak Ridge laboratory.

AEC Special Fellowships. These are available in the fields of (1) Nuclear Science and Engineering, (2) Health Physics, (3) Advanced

Training in Health Physics, and (4) Industrial Hygiene.

The application deadlines differ for different fellowships. Further information may be obtained from Lewis E. Anderson, Department of Botany.

Commonwealth-Studies Center

The Commonwealth-Studies Center was established at Duke University in 1955 and has received financial support from the Carnegie Corporation of New York, the Rockefeller Foundation, and the Ford Foundation. Its objectives are:

- 1. to encourage and stimulate by financial assistance and other means the research interests of individual scholars in Commonwealth fields,
- 2. to establish at Duke University a Center whose facilities will promote interest in research relating to the Commonwealth, provide the materials for basic research, and encourage research by Commonwealth and American students and faculty.

The Center awards fellowships to graduate students from Australia, Canada, and New Zealand who propose to study for the Ph.D. degree in economics, history, or political science at Duke University. National selection committees in each of the mentioned countries facilitate the selection of fellows.

Each spring the Center sponsors a joint seminar for graduate students in economics, history, and political science. In addition the Center sponsors occasional lectures at the University by distinguished Commonwealth scholars.

Financial assistance is provided to students and faculty at the University for field research in Commonwealth countries. Studies resulting from research sponsored by the Center are frequently published by the Duke University Press in the Commonwealth-Studies Series. The Center also distributes in its reprint series selected published articles that relate to the Commonwealth. Inquiries should be addressed to the Executive Secretary, Commonwealth-Studies Center, Duke University, Durham, North Carolina.

Cooperative Programs with the Consolidated University of North Carolina

Interchange of Registration. (See p. 52).

Library Exchange

Students of both the University of North Carolina and Duke University are granted certain library privileges in the respective libraries of each University. Books unavailable in one library may be procured at short notice through an interlibrary loan service.

The Cooperative Program in the Humanities

The Cooperative Program in the Humanities, jointly managed by Duke University and the University of North Carolina at Chapel Hill, aims at expanding and improving activities in the humanities in the two universities and throughout the region. The Program was established in 1963, with offices on both campuses, and receives substantial financial support from the Ford Foundation.

The central feature of the Program is a cooperative exchange between the two universities, on the one hand, and a number of liberal arts colleges on the other. Academic-year research leaves are made possible for faculty members from humanistic departments of liberal arts colleges located in Virginia, North Carolina, and South Carolina. These scholars are known as Humanities Fellows. Each Fellow has a significant, clearly defined research project. As partial replacements for the Humanities Fellows during their year of leave, the Program, whenever possible, offers the colleges advanced graduate students from the two universities.

The Program sponsors semester visits of distinguished professors in the Humanities. In addition to teaching, these Professors give occasional public lectures on both campuses. The Program also makes possible shorter visits by well-known humanistic scholars.

The Program has established two editorial internships, filled by advanced graduate students from Duke and the University of North Carolina. These graduate students have the opportunity to become familiar with the processes and technical aspects of scholarly publication.

Each spring the Program sponsors a humanities symposium. Representatives of colleges in the region and several outstanding humanists from other regions participate, along with all persons directly involved in

the Program.

The Program conducts two summer activities: (1) The Southeastern Institute of Medieval and Renaissance Studies has been established for the advancement of scholarship and the improvement of teaching in the southeastern region. The third Institute will consist of eight informal seminars, each led by a Senior Fellow. Each seminar will have an enrollment of six faculty members from colleges in the southeastern region. Students of all areas of medieval and renaissance studies are invited to participate. (2) A number of Summer Research Awards are available for faculty members at Duke and the University of North Carolina.

Inquiries may be directed to the Program office, 102 Library, Duke

University.

Cooperative Program in Russian and East European History

The graduate schools of Duke University and the University of North Carolina offer a cooperative program leading to the M.A. and Ph.D. degrees in Russian and East European studies. Students admitted to one institution are encouraged to enroll in those courses in the other that are advantageous to their programs, and to utilize the libraries and facilities of both universities. The holdings of the two libraries in Russian and East European materials are substantial and complementary. Both libraries have a policy of purchasing all significant published works in Slavic history, economics, government, geography, literature, and linguistics. Graduate assistantships and fellowships of various types complete the program.

Cooperative Program in Teacher Education (Secondary)

Selected graduates of liberal arts colleges who have not completed a teacher preparation program will be admitted to the Cooperative Program in Teacher Education to complete simultaneously in their graduate programs requirements for a teacher's certificate and depth in the field to be taught. Full year internships with salary are arranged with cooperating public and private school systems. Students admitted to this program are required to attend the first Summer Session before their internship. For materials describing this program write to the Graduate School of Arts and Sciences or to Director, Cooperative Program in Teacher Education, Department of Education.

Cooperative Program in Junior College Teaching

Selected graduates of liberal arts colleges who wish to prepare to teach in junior colleges should apply for admission to the Cooperative Program in Junior College Teaching by writing to the director of this program in the Department of Education. Half-year internships with salary are available in one or more cooperating junior colleges.

Resources for Graduate Study

The Libraries

The University Libraries contain 1,783,803 volumes. In addition to the collections in the General Library, there are eight school and departmental libraries: Divinity, 123,700 volumes; Engineering, 36,000 volumes; Law, 145,000 volumes; Medical, 77,500 volumes; Woman's College, 156,000 volumes; Biology-Forestry, 87,000 volumes; Chemistry, 22,500 volumes; Mathematics-Physics, 30,600 volumes. In 1965–66, 71,706 volumes were added; 8,700 periodicals and 150 newspapers are received currently.

The General Library building, which was doubled in size in 1949, incorporates many modern arrangements for the preservation of the collections and for the convenience of the research scholar. Construction on an extention of the general library facilities, designed to provide twice the existing space, began early in 1966. Book stacks, the reference room, the graduate reading room, and quarters for rare books and manuscripts are air-conditioned. In the stacks, 274 carrels are available to graduate students as places of study. Upon application, graduate students may receive permit cards entitling them the use of the stacks.

A division of photographic services, with the most modern cameras and other equipment for microfilming or other photographic reproduction of printed and manuscript materials, provides a battery of reading machines to serve the Library's large collection of microfilms of rare books, periodicals, and newspapers.

The extensive resources of the Library for research students may be

suggested by the following special collections:

The Trent Collection of Walt Whitman, containing the first and all other important early editions or issues of Leaves of Grass; books and articles of Whitman biography and criticism; nearly 300 manuscripts and 400 letters; and pictures, sheet music, and other miscellanea.

The George Washington Flowers Collection of books, manuscripts,

pamphlets, and newspapers on all phases of Southern history.

The Arents Collection of several hundred volumes relating to the culture and production of tobacco and the manufacture and distribution of tobacco products.

The James A. Thomas Collection of books on Chinese history and cul-

ture.

The Guido Mazzoni Library, a collection of approximately 23,000 volumes and 67,000 pamphlets covering the whole range of Italian literature, with special strength in the nineteenth century.

The Gustave Lanson Library of 12,000 books and monographs on

French literature.

Latin-American Collections, built around a special Peruvian library of 7,000 books and manuscripts, a Brazilian library of several thousand volumes, and an Ecuadorian library of 2,000 volumes, supplemented by strong collections of the public documents of these and other Latin-American countries.

The Robertson Library of Philippiniana.

The Frank C. Brown Folklore Collection, consisting of about 38,000 manuscript pieces, 1,400 vocal recordings, and 650 musical scores of North Carolina folklore.

The Strisower Library of International Law, numbering about 5,000

volumes, with many rare books and periodical files.

The Trent Collection in the History of Medicine (Medical Center Library), containing about 3,000 books and 2,500 manuscripts with special strength in anesthesia, anatomy, English medicine, vaccination, yellow fever, pharmacy, and medical biography.

The Holl Church History Library, dealing primarily with the period of

the Reformation.

The Frank Baker Collection of Wesleyana and British Methodism, consisting of 1,500 editions of the works of John and Charles Wesley, 8,000 volumes concerning all phases of the development of British Methodism, 4,000 volumes relating to the religious and social background of British Methodism, and 4,000 manuscript pieces by the Wesleys and their coadjutors and by British Methodists of the last 200 years.

Collections in English and American Literature, where emphasis has

been placed principally on the eighteenth and nineteenth centuries, with the collections of Swinburne, Tennyson, Rossetti, and Bryant, significant groups of annotated copies and first editions of Coleridge and Byron, the Carroll Wilson collection of Emerson, some 5,000 items of eighteenthcentury English poetry and prose, and the Paul Hamilton Hayne library of American literature.

In addition to these and other special collections, the Libraries contain excellent files of United States federal and state documents, public documents of many European and Latin-American countries, and publications of European academies and learned societies. The newspaper collection, with 13,300 volumes and 15,000 reels of microfilms, has several long eighteenth-century files, strong holdings of nineteenth-century New England papers, and of ante-Bellum and Civil War papers from North Carolina, South Carolina, and Virginia; there are also many European and Latin-American papers. The manuscript collection of 3,900,000 items is particularly strong in all phases of the history, politics, and social and economic life of the South Atlantic region, though it includes also significant papers in English and American literature, and several notable medieval manuscripts in both Greek and Latin.

Science Laboratories

Botanical and Zoological Laboratories

Facilities for graduate study in the Departments of Botany and Zoology are located on the West Campus. A Biological Sciences building, completed in 1962, contains well-equipped modern laboratories for teaching and research in the various fields of botany, forestry, and zoology. Special facilities are available, such as animal rooms, greenhouses, darkrooms, refrigerated and controlled environment laboratories, electron microscopes, Van de Graaff accelerator, X-ray machines and other radiation and radioisotope equipment, and other modern research facilities. A large "phytotron" is under construction.

The Botany Herbarium, containing over 310,000 specimens, is worldwide in scope and includes notable collections of mosses and lichens. The Biology-Forestry Library contains an outstanding collection of books and periodicals. The Library currently subscribes to over 800 journals and has 85,000 volumes. Unique assets for teaching and research are the Sarah P. Duke Gardens, conveniently located on the West Campus; the Duke Forest, comprising 7,000 acres of woodland adjacent to the West Campus; the Field Station for the Study of Animal Behavior; and the Duke University Marine Laboratory at Beaufort, North Carolina.

Scholarships for advanced study during the summer months are maintained at the Highlands Laboratory, Highlands, North Carolina, at the Marine Biological Laboratory, Woods Hole, Massachusetts, and at the Duke University Marine Laboratory. Requests for information concerning scholarships at the Highlands Laboratory should be addressed to the Botany Department, those at Woods Hole to the Zoology Department, and those at Beaufort to the Duke University Marine Laboratory.

Marine Laboratory

The Duke University Marine Laboratory is located at Beaufort, North Carolina, one and one-half miles from the open ocean. The physical plant includes five well-equipped research buildings, three class rooms, and three dormitories. The Laboratory provides excellent facilities for graduate courses in botany, geology, and zoology and for thesis research throughout the year. Special research and training facilities for field work in marine biology and biological oceanography include two motor vessels and a new 118-foot biological research vessel Eastward, with specialized apparatus for collecting and environmental measurements.

Six National Science Foundation Predoctoral Traineeships in biological oceanography and two Bureau of Commercial Fisheries Educational Grants in marine biology are available to advanced graduate students during the academic year. In the summer of 1967 twenty-five National Science Foundation Predoctoral Awards will be offered for course or research work in marine biology at the Marine Laboratory. For information concerning awards, courses, and research space, write to the Director, Dr. C. G. Bookhout, Duke University Marine Laboratory, Beaufort, North Carolina.

Animal Behavior Station

Located less than one mile from the campus, the 75 wooded acres of the Station provide facilities for studies of penned and free-ranging, and caged animals. These facilities include sound-proof observation chambers, barns, aviaries, and pens for large mammals and birds, and two water-fowl ponds. A permanent facility for pro-simian primates (both simulated "natural habitats" and cages) will be completed by the spring of 1967. For information regarding research space or research assistantships in Behavior, write to Dr. P. H. Klopfer, Dept. of Zoology, or Dr. D. K. Adams, Dept. of Psychology.

Physical Laboratories

The Physics Building, comprising about 130,000 square feet of floor space, is devoted to the research and instruction of the Departments of Physics and Mathematics.

In addition to the lecture halls and the elementary laboratories, there

are instructional laboratories for work in electronics and advanced

physics.

About half the building is devoted to special laboratories for research in microwave spectroscopy, atomic, nuclear, high energy, low temperature and solid state physics. Special equipment includes microwave spectrographs operating up to 500,000 megacycles; one 4 MEV and one high resolution 3 MEV Van de Graaff accelerator (a 30 MEV cyclotron/tandem Van de Graaff accelerator is to be installed during 1967); a helium liquefier, cryostats, magnets and associated equipment for research down to the millidegree Kelvin temperature range; a DDP-24 computer used with two projection microscopes in the High Energy Physics Laboratory and a DDP-224 computer used in the Nuclear Structure Laboratory.

Duke University and the Raleigh and Chapel Hill branches of the University of North Carolina have organized a joint computing center which is equipped with a powerful computing system consisting of an IBM System/360 Model 75 at the Research Triangle center with a 360/

Model 30 on each of the three campuses.

The Physics-Mathematics Library contains an unusually complete selection of books and periodicals. A large, well-equipped instrument shop staffed by nine instrument makers, four electronic technicians, and a glass blower is in the building. Graduate students are provided with office space in the Physics Building.

Chemistry Laboratories

The Chemistry Building has a floor area of approximately 57,000 square feet, of which more than half is devoted to advanced teaching and research. The Department is well-equipped for conducting research in analytical, inorganic, organic, and physical chemistry. Programs are active in all of these areas. For support of these programs, modern instruments are available for routine measurements, as well as for research involving ultraviolet, visible, and infrared spectroscopy. Also provided are two nuclear magnetic resonance spectrometers, one for routine analytical purposes, and the other, a high resolution instrument, for research. In addition to extensive equipment for X-ray crystallography, facilities are available for electron spin resonance measurements, polarography, light scattering, and mass spectrometry.

Well-equipped shops, with a mechanic and an electronics technician, provide facilities for the construction of special apparatus and for repair

and maintenance of instruments.

The Chemistry Library, conveniently located in the building, has on its shelves over 22,600 volumes, and currently subscribes to over 230 scientific periodicals.

Psychology Laboratories

The Psychology Department occupies new and fully renovated quarters, comprising about 53,000 square feet of floor space, which house its main laboratories, seminar rooms, classrooms, and special facilities. The building is completely air-conditioned for year-round research and study. For the use of graduate students and staff, the Department houses a periodical reference room with an extensive collection of current and bound journals and monographs in psychology and related subjects. In addition to general purpose laboratories, there are special facilities for animal behavior studies; sound-proofed and electrically shielded rooms for use with human and animal subjects; specially equipped rooms for the study of visual perception; electrophysiological recording rooms; a histological laboratory and surgery; photographic dark rooms, etc. The social psychology unit (joint with the Department of Sociology) contains observation, communication, and recording facilities for the study of social interaction. There is an extensive suite of interview and observation rooms for the study of human personality and clinical processes. An on-line digital computer is located in the animal behavior laboratories, and automatic computation equipment is available for all research purposes. A departmental shop, with competent technicians in charge, is maintained to provide specialized mechanical and electronic apparatus. Other facilities for research and teaching are available in the laboratories and clinics of the adjacent Duke Medical Center.

A number of clinical installations for adults and children, devoted to an extensive range of clinical and guidance problems, cooperate with the department in providing facilities for research and training. In addition, the Department operates a Preschool Laboratory for four- and five-year old children. The Department cooperates with the Department of Zoology in the operation of a 75-acre field station in the near-by Duke Forest for the study of animal behavior in natural settings. (See p. 27, Animal

Behavior Section.)

Computing Laboratory

Since 1958 an IBM electronic digital computer has been available in the Computing Laboratory for instruction in programming and for research. The Computing Laboratory is under the guidance of the Department of Mathematics and is being used for research in the physical sciences, engineering, mathematics and in the biomedical and social sciences. The Laboratory is equipped with an IBM 360 computer which has direct access through a telephone linkage to an IBM 360 Model 75 having very large memory capacity. This computational network will be shared with North Carolina State University at Raleigh and the University of North Carolina at Chapel Hill. It formed, at the time of its installation, one of the most powerful computing systems available to any university.

Engineering Research Laboratories

The laboratories of the three departments which comprise the School of Engineering contain a wide range of basic equipment that finds general application in the several fields of specialization. In addition, each laboratory contains selected items of highly sophisticated equipment used to support advanced research in areas of particular emphasis. The exceptionally fine facilities available for instruction and research are suggested by the following brief listing of selected items to be found in

the three departments.

Civil Engineering: closed-loop, electrohydraulic dynamic loading system capable of applying pulses of any shape, of magnitudes up to 5,000 pounds, and controlled in either force or displacement modes in frequencies from zero to 100 cycles per second; vacuum-forming facilities for structural shell models; high-speed digital strain-measuring and recording systems; high-pressure triaxial shear apparatus for confining pressures up to 100,000 p.s.i.; high-speed camera for studying explosions and similar phenomena; large-aperture research polariscope; reflective photoelastic polariscope; sustained-loading facility for long-duration studies of prestressed concrete.

Electrical Engineering: high-resolution (7Å) electron microscope with heating and tilting stage; stereo optical microscopes; ion-pumped bakeable ultra-high-vacuum unit; helium dewars and cryostats; 9.5-inch magnet and regulated power supply with complete nuclear magnetic resonance system; spin-echo spectrometer; x-ray diffraction diffractometer with monochromator attachment furnaces; environmental test chambers; analog computer facility; multichannel tape and strip-chart recorders; complete x-band microwave instrumentation system; sampling oscilloscope; cryomagnetic facility for susceptibility measurements.

Mechanical Engineering: mechanical shock tester; function generators; electrodynamic vibration analyzer; 12-channel recording oscillograph; multichannel recorder; fuel combustion research engine; steam turbine heat exchanger equipment; facilities for studying both compressible and incompressible fluid flow; anechoic room; experimental vacuum-transport system; universal testing machine; universal injection molding machine; heat-treating furnace; hardness testers; electronic polisher; various metallurgical microscopes, including both stereo- and high-temperature instruments; analog computer facility.

Available to graduate students in all three departments of the School of Engineering are also the Central Service Shop facilities of the School,

as well as those located elsewhere on the campus.

A major resource of Duke University is the Library, the School of Engineering division of which contains over 36,000 volumes and receives more than 450 periodicals. Students have full access to other specialized collections elsewhere on the campus.

The School of Engineering houses an IBM Model 1978 medium-speed card-reader punch and printer which communicates directly with the IBM System 360/Model 75 computation facility that is located in the Triangle Universities Computation Center in the adjacent Research Triangle Park.

Forest Sciences Laboratory

The establishment of the Forestry Sciences Laboratory research facility of the Southeastern Forest Experiment Station in the Research Triangle Park near Durham provides an unusual opportunity for complementing the research programs of students in the Department of Forestry. Specialized research projects in forest entomology, pathology, physiology and soils are currently under way at the Laboratory. The staff of the Laboratory is available for consultation, participation in seminars and may offer advice to students conducting research in the Department of Forestry. Arrangements may also be made for students to conduct certain aspects of their research at the Laboratory.

Duke Forest

The Duke Forest consists of approximately 7,000 acres of land, most of which is adjacent and easily accessible to the University campus. Situated in the lower Piedmont region and composed of second-growth shortleaf pine, loblolly pine, and hardwoods, the Forest is representative of the various types of timber growth and soils found throughout the region. Through placing the Forest under intensive management for forestry purposes, substantial progress has been made in developing the educational work and research in forestry.

The proximity of the Forest to the laboratories, greenhouses, phytotron, and library facilities of the University provides an excellent opportunity for advanced study and research in forestry. Research, particularly in the fields of forest ecology, forest climatology, forest soils, forest management, properties of wood, forest-tree physiology, forest entomology, and forest pathology, is well under way. Several members of the botany and

zoology staffs are also engaged in research in the Duke Forest.

Student Life

Living Accommodations

Duke University strives to provide comfortable, attractive living accommodations for graduate-level resident students, both married and unmarried.

The Graduate Center houses men and women enrolled on a full-time basis in the Graduate School of Arts and Sciences and the professional schools. Graduate women are also assigned to Hanes Annex, a residence hall, and to Town House Apartments located between West and Woman's College campuses.

The men's section of the Graduate Center houses 310 students. Sixty beds in 30 double rooms have been established in a wing of the building for women students. Commons facilities on the main floor are shared by

men and women.

Hanes Annex has 39 beds for graduate and para-medical women students. The second floor of this building is used by seniors in the School of Nursing. Commons areas are jointly used by the two living groups.

Rooms in residence halls are normally rented for the academic year,

but for no period less than one semester or specified term.

Town House Apartments include twenty-six two bedroom units, each furnished for three graduate women students. Two students occupy the master bedroom and the third occupies a smaller bedroom. A living room, kitchen and one and a half baths complete these attractive living

units. No effort is made by the Director of Housing to assign bedroom

space within each apartment.

Duke University Apartments for full-time married graduate and professional students are located in Duke Forest about one mile north of West Campus. The 224 units are complete with basic furnishings. Students with more than two children are not eligible for married graduate housing. Couples without children are not normally eligible for two bedroom units.

Rooms in residence halls, spaces in Town House Apartments, and units in the married student apartments may be reserved by applicants only if they have been accepted by the Graduate School of Arts and Sciences, and after the required \$25 room or security deposit has been made with the Duke University Bursar. The initial room or security deposit is required with the application and is held until the room or apartment is vacated. Application forms and detailed information on graduate housing will be mailed when the Graduate School of Arts and Sciences has notified the Director of Housing of official acceptance of the student. Single women may express a choice for the type of housing desired. Completed applications for rooms and apartments are to be returned, with required deposits, to the Director of Housing, Duke Station, Duke University, Durham, N. C. Assignment priority is established by the date of receipt of completed applications with deposits in the office of the Director of Housing.

Regulations governing occupancy of rooms and apartments will be provided to the applicant by the Director of Housing at the time application forms are forwarded to accepted students. Occupants within each type of housing are expected to comply with the appropriate regulations.

For the cost of housing and for details on rental refund policy, see the section on Housing in the Financial Information Chapter.

Food Services

Food service on both the Woman's College Campus and the West Campus is cafeteria style. The dining facilities on the West Campus include two straight-line cafeterias with multiple-choice menus, a free-flow service area which includes cafeteria counters as well as a grill, and a table service dining room called The Oak Room where full meals and a la carte items are served by waitresses. The Graduate Center has a cafeteria open at meal hours, and a coffee lounge which is open until 11:00 p.m. Because of the large number of those served in the dining halls, it is not possible to arrange special diets for individual students.

For cost of food services, see the Chapter on Financial Information.

Medical Care

The complete medical facilities of the Duke University Medical Center are available to all members of the University community. To secure the benefits of the Student Health program, a graduate student during the term or semester in which the illness occurs must (1) in the Summer Session term be registered for at least 1 unit research or 3 units of course work, (2) prior to completing minimum residence requirements be registered for at least 9 units per semester and thereafter according to the schedule on pp. 49 and 50. Students are not covered during vacations and their dependents and members of their family are not covered at any time. Care is provided for men at the Student Health Office in Duke Hospital and for women at the Woman's College Infirmary and in the Student Health Office.

The service provided includes hospitalization in Duke Hospital, when recommended by the Hospital staff, to a limit of thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Students pay for board while in the hospital. Excluded from the service are refraction of eyes, treatment of teeth, and of all chronic and pre-existing conditions, and elective surgery.

Off campus injuries and accidents are not covered by Student Health. Graduate students are urged to carry adequate health insurance to supplement Student Health Program services. If students have insurance providing hospitalization, surgical, or medical benefits, the benefit shall

be applied to the cost of their medical care.

Students whose course-load entitles them to full coverage under the Student Health program are eligible for a complementary insurance policy which then comprises protection for the entire calendar year. Concerning this complementary policy inquire of the Dean of the Graduate School. Foreign students are required to hold this or another acceptable policy.

Student Activities

Graduate students new to Duke University may be reminded that they are welcomed to use such recreation facilities as swimming pools, tennis courts, golf course, and to affiliate with choral, drama, and religious groups. They may become junior members of the American Association of University Professors and may affiliate with Phi Beta Kappa and social fraternities. Wives of graduate students may join the very active Graduate Wives Club.

The Duke University Counseling Center

Through the Counseling Center, the University provides a professional

counseling service designed to aid students in gaining a better understanding of themselves and the opportunities available to them. Counseling is available in the areas of career planning, educational opportunities, and personal and social adjustment.

The Center maintains files of educational and vocational information related to career planning, graduate educational programs and fellow-

ships, and study aids.

National and University-wide testing programs are administered by the Center. A continuing program of research in the areas of counseling and testing is also carried on by the staff of the Center.

Appointments Office

Duke University maintains an active Appointments Office which has steadily been placing students in teaching and industrial positions. The services of this office are available without charge to graduate students. Those who are interested in securing employment through the Appointments Office, or those who wish to have available for their own use in securing employment a complete file containing their academic record and pertinent recommendations, should register in this office.

Research and Publications

The several departments of the University are devoted to research as well as to instruction. Since the University exists for the promotion and diffusion of knowledge, attention is rightly placed, in the Graduate School, on research activities.

In furtherance of the University's obligation to promote and diffuse knowledge, the President annually appoints a University Council on Research, which receives applications from members of the various faculties for subsidies in support of research. Vigorous and forward-looking policies of this Research Council have initiated and encouraged the

completion of many substantial and important research projects.

The Duke University Press takes its place as a significant agency in the diffusion of knowledge. Created in 1925, as a successor to the Trinity College Press, the Duke University Press continued the publication of the South Atlantic Quarterly, published at Trinity College since 1902, and in 1926 revived the Hispanic-American Historical Review, which had been founded and published from 1918 to 1922 by a group of scholars interested in Hispanic America. In 1929 American Literature was begun with the cooperation of the American Literature Group of the Modern Language Association. This journal was followed in 1931 by Ecological Monographs, and in 1932, Character and Personality (since 1945 the Journal of Personality). In 1935 the Press began the publication of the Duke Mathematical Journal. Since 1948 it has published Ecology, the official journal of the Ecological Society of America. The Law School of Duke University publishes Law and Contemporary Problems, The Duke Bar Journal, and

The Journal of Legal Education.

The Press, since its organization, has published more than three hundred and sixty-five volumes, including four series of monographs and twenty-seven books published for the Duke University Commonwealth-Studies Center, and has thus made public the fruits of scholarly research of the Duke faculty and of scholars elsewhere. In the broadest sense, the policy of the Press is to make available to the public any scholarly work that merits publication though special attention is given to works in domains of knowledge cultivated by the University.

Visiting Scholars

The libraries and, to the extent practicable, other facilities of Duke University will be made available to faculty members of colleges and universities who wish to spend a period of time on the campus in pursuit of their scholarly interests. No fees will be charged such visitors unless they wish to participate in activities for which a special fee is assessed. Room and board may be arranged for at the regular rates in the dormitories and dining rooms. Dormitory space is usually available during the summer months. Inquiries concerning residence for visiting scholars should be directed to the Dean of the Graduate School of Arts and Sciences.

Admission

Students Requiring Admission

Admission is required of (1) all students who intend to pursue study toward a degree offered by the Graduate School, (2) all other students who desire credit for whatever purpose for graduate courses—except students who register as Special Students in the Summer Session. Students who have discontinued a program of study after earning a master's degree here must by letter request permission of the Dean to undertake a doctoral program.

Prerequisites

A student seeking admission to the Graduate School of Arts and Sciences of Duke University must have received an A.B. or B.S. degree (or the equivalent in the case of foreign students) from an accredited institution. His undergraduate program should be well rounded and of such quality as to give positive evidence of capacity for graduate study. Normally he should have majored in the area of his intended graduate study. Many departments (see Courses of Instruction, p. 59) list specific prerequisites. Students are urged to anticipate at least one of the language requirements (see pp. 54-56).

Procedures

A student seeking admission to the Graduate School should request the Dean of the Graduate School to send an application blank. This he should fill out completely and return promptly. In addition he should provide the following supporting documents: (1) two copies of a transcript or transcripts of all his undergraduate and graduate work mailed directly by the registrar to the Dean; (2) as soon as possible, supplementary transcripts showing completion of work in progress when the earlier transcript was made; (3) three letters of recommendation written on the forms provided by persons best qualified to judge him as a prospective graduate student and mailed directly to the Dean; and (4) scores on the Graduate Record Examination or Miller Analogies Test as indicated.

All applicants except foreign students applying from outside the United States and non-degree students must include the application fee of \$5.00 in check or money order payable to Duke University.

Graduate Record Examination and Miller Analogies Test

As additional evidence of capability, scores on the Graduate Record Examination, particularly the Aptitude Test, and on the Miller Analogies Test are strongly recommended in all departments and must be submitted if either test has been taken. Scores on the Graduate Record Examination may be requested of any applicant whose record is marginal and must be submitted by all applicants for a fellowship. Information on times and places of Graduate Record Examinations can be provided at the applicant's college or by the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey. Departments that require scores of all applicants are listed below:

es

Departments	Graduate Record	d Examination Advanced	Miller Analogie
Anatomy	×	X	
Biochemistry	×	X	
Botany	×	X	
Chemistry	×	X	
Economics	×	X	
English	×	X	
Forestry	Ŷ	,	
Geology	×		
German	×		
History	×		
Mathematics	×		
Microbiology	Ŷ	×	
Pathology	$\widehat{\times}^1$	^	
Philosophy	×¹ ×		\times^2

¹ If the candidate does not already hold an M.D. or D.V.M. degree he will be required to take the GRE Aptitude Test.

² Either GRE or MAT.

Physics	×	×	
Physiology	X		
Political Science	X		
Psychology	X	X	×
Religion	X		
Romance Languages	×	X	
Sociology	X	X	
Zoology	X	X	

Additional Procedure for Foreign Students

Fully qualified students from outside the United States are welcomed in the Graduate School to take courses and in many instances to study toward a degree. In applying for admission the foreign student should, in addition to the information required of all students, submit with his application (1) if his native language is not English, certification of ability to use English such as scores on tests provided by the Educational Testing Service (TOEFL), the University of Michigan Language Institute, or the American University Language Center, (2) a statement certified by a responsible person that his finances are sufficient to maintain him during his stay at Duke University, and (3) a statement by a qualified medical doctor describing any emotional or physical illness the applicant has had during the previous five years.

All foreign students whose native language is not English will be examined during their first registration period for competence in the use of oral and written English. Until competence is determined, admission and arrangements for an award involving teaching must remain provisional. Students found to lack the necessary competence will be required to enroll in the non-credit course English for Foreign Students and to reduce their course or research program three units if necessary. Passing this examination or the course, if it is required, will not meet

degree requirements for a foreign language. (See page 56.)

Notification of Status

When admission is approved, the student will receive a letter of admission and an acceptance form. The process of admission is not complete

until the statement of acceptance has been returned.

Applicants who are admitted will be offered full admission, provisional admission, or non-degree admission. Provisional admission is offered to students who (1) appear to warrant admission but who do not fully comply with admission requirements, for a trial period of one semester or a minimum of 12 hours of course work, or (2) are admissible except that the application lacks a letter of recommendation, a supplementary transcript, required test scores, or some other required information. Nondegree admission is offered to students who (1) have no intention of taking an advanced degree at Duke University but wish to take courses for accreditation, for transfer to other institutions, or for other purposes,

(2) do not fully meet admission requirements but wish to further their academic interests, and (3) who apply late and must register before the application can be fully considered. Graduate credit earned under provisional status may be applied toward an advanced degree at Duke University if and when upon review the student is granted full admission; graduate credit earned under non-degree status may not be applied toward an advanced degree at Duke University. Late applicants [(3) above] will be granted full admission if admission can be completed within two weeks of registration.

Closing Dates for Applications

It is the applicant's responsibility to make certain that his application is completed and in order before the dates specified. Because applications cannot be reviewed until all required supporting documents are filed, applications should be submitted at least *two weeks* before the closing dates listed below:

Fall semester, admission and award	
Fall semester, admission only	August 1
Spring semester, admission only	January 1
Summer Session,* First Term	
Summer Session,* Second Term	June 21

[°] Students seeking admission to the Graduate School for study in the Summer Session should make application to the Dean of the Graduate School as well as to the Director of the Summer Session.

Financial Information

Tuition and Fees

The Graduate School awards such financial aid as fellowships, scholarships, and assistantships. The several departments engage part-time instructors who may be graduate students. The Treasurer of the University, however, has sole responsibility for paying stipends to students, collecting from them such fees as are due, and making special arrangements for prorating fees.

Estimated Expenses in the Academic Year

The necessary expenses of a graduate student are moderate. The University dormitories and Unions provide comfortable and wholesome living conditions at a minimum cost. Incidental expenses for recreation, traveling, clothes, and other items naturally depend on the tastes and habits of the individual. The table below lists the necessary college expenses for one academic year for a full program of work:

Low	Moderate	Liberal
Tuition and fees\$1410.00	\$1410.00	\$1410.00
Room Rent* 310.00	335.00	380.00
Board 500.00	550.00	600.00
Laundry 30.00	40.00	50.00
Books 30.00	40.00	50.00
\$2280.00	\$2375.00	\$2490.00

In residence halls.

General Fees in the Academic Year

The following table shows the general fees and charges collected from all students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration for that semester. All fees are subject to change without notice. No student is admitted to classes until arrangements have been made with the Bursar of the University for the settlement of fees.

Tuition and general fees* (\$47.00 per unit)\$ Athletic fee, optional, per year, not including federal tax,	705.00
payable in the fall semester	15.00
Binding fee, two copies of thesis or dissertation, other copies	
optional, \$5.00 a copy	10.00
ETS Foreign Language Test, each administration, payable to	
the University Counseling Center	8.00
In absentia fee, due on date of registration, one unit	
per semester	47.00
Late registration fee	5.00
Microfilming fee, doctoral degree only, upon final	
submission of dissertation	25.00

^o General fees, in lieu of most special charges, include the following fees: Matriculation, Medical, Library, Damage, Commencement, Diploma, and an average of the Laboratory and Material Fees.

Tuition and fees for a full semester program of 15 units amount to \$705.00. For a part program, tuition and fees are computed at the rate of \$47.00 per unit. After the day of registration, no refund of the tuition and fees will be made except for involuntary withdrawal to enter the armed services or as indicated on p. 50 (Change of Registration).

Special Fees for Teachers and Others

The Graduate School recognizes a special obligation to encourage the following types of students in their professional and personal advancement: (1) members of the faculties of the neighboring public schools and colleges, currently engaged in *full-time* teaching while taking courses in the Graduate School, (2) ministers of neighboring churches, (3) wives of Duke faculty members, (4) *full-time* employees of Duke University who are paid on a monthly basis *throughout* the year and have been employed for two years. The reduced fees do not apply to teachers and ministers while on leave of absence, nor to holders of fellowships, scholarships, or graduate and research assistantships, nor to part-time instructors.

Persons eligible for the reduced fee must meet the admission standards required of all graduate students and must be admitted to the Graduate

School. They may enroll for one or two courses per semester (in no case totaling more than 7 units) upon payment of a fee of \$5.00 for registration for each semester and a tuition fee of \$25.00 per unit of credit or an audit fee of \$25.00 per course. The in absentia fee will not be charged at this rate.

Audit Fee

In a semester in which a student registers and pays fees for 12 units or more, he may audit one course without charge. Should he be permitted to audit a second course or should he be registered for less than 12 units, the audit fee is \$25.00 per course.

Transcript

A student who wishes to transfer his credits from Duke University to another institution is entitled to one free transcript of his record. A fee of one dollar, payable in advance, is charged for each additional copy. Requests are directed to the Central Records Office.

Fee Adjustment with Change of Registration

Arrangements made with the Bursar to prorate tuition and fee charges do not imply that the full amount is not due and payable on the date of fall and spring registration. For fee adjustment arising from change of registration, see Change of Registration, page 50.

Stipends and Income Tax

Ordinarily stipends awarded under fellowships and scholarships are not subject to income and Social Security tax. However, a portion of the award to graduate assistants and research assistants may be subject to both. The Graduate Office will supply detailed information.

Living Accommodations

Housing

Rooms in residence halls are normally rented for the academic year, but for no period less than one semester or specified term. The rental charge for each person assigned to a double room is \$310.00 for the academic year. Single rooms, limited in number and usually rented to returning students, rent for \$380.00 for the academic year.

Each student assigned to the Town House Apartments is currently charged \$450.00 for the academic year. If space permits, two students

may rent an apartment for the academic year for \$675.00 each. Utility charges are included in these rates.

Duke University Apartments for full-time married graduate and pro-

fessional students currently rent at the following rates:

Efficiency Unit.....\$70.00 per month One-Bedroom Apartment.....\$90.00 per month Two-Bedroom Apartment.....\$110.00 per month

Utility expenses are included in these rates.

Rooms in residence halls, Town House Apartments and married student apartments may be reserved by applicants only if they have been accepted by the Graduate School and only after the required \$25.00 room or security deposit has been made with the Duke University Bursar. This initial deposit is held until the room or apartment is vacated.

No refund on residence hall room rent or the rent for spaces in Town House Apartments is made to students who withdraw after the date of registration, except for those who involuntarily withdraw to enter the armed services. Such refunds will be made in accordance with the

University's established schedules.

For further information on housing facilities, see Living Accommodations in the chapter on Student Life.

Food Services

Food service, on both the Woman's College Campus and the West Campus, is described on p. 33. The cost of meals approximates \$2.25 to \$2.75 per day, depending upon the need and taste of the individual.

Motor Vehicles

Each student possessing or maintaining a motor vehicle at Duke University shall register it annually at the beginning of the fall semester. If a student acquires a motor vehicle and maintains the same at Duke University after registration, he must register it within five (5) calendar days after operation on the campuses begins. Resident students are required to pay an annual parking fee of \$30.00 for each motor vehicle, excepting that a parking fee of \$10.00 is required for each motorcycle, motorbike, or motor scooter.

At the time of registration of a motor vehicle, the following documents must be presented:

- (a) State vehicle registration certificate.
- (b) Valid driver's license.

- (c) Satisfactory evidence of automobile liability insurance coverage with limits of at least \$5,000 per person and \$10,000 per accident for personal injuries, and \$5,000 for property damage, as required by the North Carolina Motor Vehicle Law.
- (d) If the student is under 21, a statement signed by the student's parent or guardian granting the student permission to operate a motor vehicle at Duke University.

Student Aid

For the encouragement and financial assistance of graduate students of marked ability, Duke University has established a considerable number of fellowships, scholarships, and assistantships. The stipends for these range from \$600 to \$3,400. Holders of grants pay tuition and other fees regularly required of all graduate students.

Fellows and scholars pay full tuition and fees and are expected to register for a full schedule of course work each semester. In general, assistants register for a four-fifths program and pay 12 units tuition and

fees per semester.

Application for Awards

Application for these awards, along with all supporting documents, must be submitted on or before February 15. Notification of awards other than assistantships may not be sent before March 21 and will be shortly thereafter. Late applications will be considered, should any vacancies occur in the list of appointees. Appointment is made for one academic year, but renewal is possible.

Further information and application forms may be obtained from the

Dean of the Graduate School, Duke University.

Payments to Holders of Awards

Payments of stipends to all graduate students holding fellowships, scholarships, and graduate assistantships for the academic year are made by the Bursar of the University in eight monthly installments payable on the 21st of each month beginning October 21st. Arrangements may be made to prorate tuition charges on the same basis.

Research Assistantships

Appointments are for pre-doctoral candidates whose special training and qualifications enable them to serve as assistants to individual staff members in certain departments. Stipends range from \$700 to \$3,200

based on the assisting time required.

Appointments are made to qualified, advanced students as Research Associates, Research Fellows, and Research Scholars. Stipends range upward from about \$1,800.

Graduate Assistantships

Appointments as Departmental Assistants and readers carry a total stipend in the range of \$1,000 to \$3,600. The value of stipend is determined by the fraction of time given to assisting, the qualifications of the assistant, and the nature of work assigned.

University Scholarships

The University offers a number of scholarships with stipends ranging from \$700 to \$1,800.

Fellowships

Approximately thirty James B. Duke Fellowships and one Angier Duke Memorial Fellowship with stipends (levels I and II) of \$3,800; level III, \$2,500; one Ottis Green Foundation Fellowship in Humanities or Social Sciences of \$2,500; four Gurney Harriss Kearns Fellowships in Religion ranging up to \$2,800; University Fellowships ranging from \$2,000 to \$3,000.

Special Fellowships

Cokesbury Graduate Awards in College Teaching

These awards, sponsored by the Board of Education of the Methodist Church, are designed to assist graduate students who are committed to a Christian philosophy of higher education and who intend to teach in college. The applicant must have been a member of the Methodist Church for at least three years, and must have been accepted for or be currently pursuing a program of graduate studies at one of the Methodist-related universities, including Duke University, approved for this program. Awards, for one year, vary in amount from \$600 to \$2,500.

Application must be completed before February 15. For further information and application forms, apply to the Dean of the Graduate School.

Charles W. Hargitt Research Fellowship in Zoology

The Charles W. Hargitt Research Fellowship in Zoology is devoted to the promotion of research in the field of cellular studies. It may be

awarded to post-doctoral candidates or established investigators who desire to engage in research and to outstanding predoctoral candidates in support of their graduate training. The recipient will be expected to engage in full-time research or training and will have no departmental duties. Research facilities will be provided. Appointment is for one year with the possibility of reappointment.

Inquiries and applications should be addressed to the Chairman, Hargitt

Fellowship Committee, Department of Zoology.

Shell Fellowships

In African Studies. Two fellowships are available to qualified students in social sciences who are preparing for careers in the State Department, including the foreign services of the United States, the United Nations, or other international agencies, or in research and teaching in international affairs in academic institutions within the United States. They must be citizens of the United States or presently residing permanently in the United States and intending to become citizens. The fellowships are intended to cover the expenses of field research in the preparation of doctoral dissertations. The stipend for each fellowship is \$4,000 plus a reasonable amount for transportation expenses. Inquiries should be made to the Executive Secretary, Commonwealth-Studies Center, Duke University.

Exchange Fellowships with the Free University of Berlin

Duke University has an exchange arrangement with the Free University of Berlin which will provide fellowships for two graduate students to work during the regular academic year in Berlin. Departments will submit nominations to the Dean of the Graduate School before February 15.

Apprentice Teaching Fellowships—English, History, Religion

Twelve second- or third-year graduate students-five in English, four in History, and three in Religion-may be granted two-year fellowships with an annual stipend of \$2800 plus tuition. Appointment results from recommendation of the department and selection by a Graduate School committee. The fellowship involves carefully directed apprentice teaching. The funds are provided by the Danforth Foundation.

Peace Corps Fellowships

Two Peace Corps Fellowships may be offered to first-year applicants to a doctoral program who have completed duty with the Peace Corps. Request for consideration for this award should be noted on the application for admission, which must be filed before February 15. Recommendation will be made by the major department. The stipend will vary from \$2,000 to \$3,000.

Fellowships and Graduate Scholarships in Forestry

Information regarding special fellowships and graduate scholarships in forestry may be obtained from the Dean of the School of Forestry, Duke University, Durham, North Carolina.

Federal Fellowship Programs

In 1966-67 Duke University was approved to offer programs sustained by National Defense Act Graduate Fellowships in Biochemistry, Botany, Chemistry, Economics, Electrical Engineering, English, Forestry, History, Mathematics, Philosophy, Physics, Political Science, Psychology, Romance Languages, Sociology, and Zoology, and Foreign Language Fellowships. The University is approved to recommend applicants for Summer Fellowships for Graduate Teaching Assistants offered by the National Science Foundation, to offer NASA Predoctoral Traineeships in the space sciences, and NSF Graduate Traineeships.

Part-Time Instruction

A number of departments offering graduate work make use of exceptionally qualified graduate students as part-time instructors. These students are usually able to register for a graduate program of 9 units a semester. Inquiries concerning such appointments should be directed to the Chairman of the Department concerned.

Loans

The University has been allotted a sum for use under the provisions of the National Defense Act Loan fund. In addition, University funds are available to grant low-interest loans to deserving students of good academic standing. Application should be made to Mr. W. O. Petty, Jr., 102B Allen Building, Duke University, not later than July 1, preceding the academic year for which assistance is requested. For the amount of registration required for eligibility for loans, see page 49.

University Registration and Regulations

Registration

Who Must Register

(1) All students who enter course work or residence for credit; (2) all students who have completed minimum requirements for an advanced degree, but continue to use the facilities of the University in their research; (3) all students in in absentia status; (4) all students who wish merely to audit a course or courses.

The resident student engaged in a master's program which is not terminal but preparatory to a doctoral program registers as though he

were a doctoral student.

The resident student in a doctoral program carries normal registration through the semester in which he passes the preliminary examination. If he remains in residence, he continues to register for a minimum of 3 units a semester until the dissertation is accepted. If, before or after passing the preliminary examination, he elects to go out of residence, he registers for 1 unit a semester in absentia in order to keep his program active.

It is necessary to be a fully registered student according to the regulations listed above (except when registered in absentia) in order to establish eligibility for library carrel and laboratory space, for student housing, for University and some outside loans, for Student Health service including the voluntary Walker plan coverage, and for reporting status

for military duty.

The registration of 1 unit a semester in absentia provides occasional consultation with the thesis or dissertation supervisor. It may be waived

for military duty or serious problems of health.

In the Summer Session 6 units a term is maximum registration. Students resident in the academic year who wish to continue study and use of University facilities including Summer Session Student Health during the summer must register for 1 unit in the first Summer Session term. This registration provides use of these facilities for both terms.

Registration

After the applicant has received notification of his admission to the Graduate School and has returned his statement of acceptance of admission, he may present himself for registration. During the registration periods, announced in the Bulletin, he first confers with the Director of Graduate Studies of his major department, who prepares and signs a course card, listing the course work to be taken during the semester. The student then presents this course card to registration officials, who enroll him officially in his courses. After his first registration period as a current student he will pre-register at the stated times for pre-registration. Failure to pre-register incurs the penalty for late registration. Former students who intend to register to resume a degree program must give the Department and the Dean notice of this intention two months before registration.

Late Registration. All students are expected to register or pre-register at the times stated in the *Bulletin*. Those registering late, including those who are obliged to register in absentia, are subject to a late registration

fee of \$5.00.

Change of Registration. During the academic year within a period of fourteen days from the day of registration, registration may be changed with the approval of the Director of Graduate Studies if no reduction in fee is entailed, or, if fees are to be refunded, only with the approval of the Dean. An additional period of seven days is provided for changes resulting from passing a preliminary examination. Thereafter during the first thirty days from the registration date, the only permissible change is dropping course-seminar registration and adding equivalent units of research, with the approval of the Director of Graduate Studies, the instructor of the course, and the Dean.

Academic Regulations

Although ideally graduate study is principally individual reading, research, and laboratory experimentation under guidance, academic

progress in the United States is generally measured and recorded in terms of course hours and credits. The term residence designates full-time study and research in close proximity to facilities provided for both as opposed to part-time study incidental to a full-time occupation. Here required residence of one year is defined as two successive academic semesters of not less than nine units registration each semester. Credit for courses and seminars, research, and residence, and corresponding tuition and fees are stated in terms of units. According to conventional measurement one unit is equivalent to one semester hour.

Course Load

A graduate student is designated as fully registered when he registers for the maximum credit his program requires. Required registration is set in consideration of the student's obligation to teach or assist and the stage he has reached in completion of degree requirements. In the academic year normal registration for the resident student who does not hold an appointment as part-time instructor or assistant or does not engage in part-time work is 15 units a semester or 30 units an academic year. The normal registration for the student who holds such an appointment or undertakes such work is either 12 units or a minimum of 9 depending upon the number of hours a week he is required to devote to such duties.

The resident student in a terminal master's program which requires no thesis carries normal registration until he has met all degree requirements. If a thesis is required and the student has met all requirements except for submitting his thesis, he registers for 3 units a semester while in residence or, if he elects to go out of residence, for 1 unit in absentia each semester

until the thesis is accepted.

A Master's degree without thesis requires a minimum of 30 units of graduate credit in course and seminar work properly distributed between

major and minor fields.

A Master's degree with thesis requires a minimum of 30 units of graduate credit; not less than 24 units must be in course or seminar work properly distributed between major and minor fields; a minimum of 6 units must be in thesis research. If after completion of the 30-unit requirement the candidate remains in residence, he must register for a minimum of 3 units per semester. If he is not in residence, he must register for one unit in absentia.

A Master's candidate who is properly registered as stated above will not be charged a thesis fee. (For fees for completing the degree during the Summer Session see the Summer Session Bulletin.)

Credits Earned Outside This Graduate School

(1) Graduate Credit Earned before the A.B. Degree Is Granted. Ordinarily no credit will be allowed for graduate courses earned before

a student has been awarded his A.B. or B.S. degree. However, an undergraduate student at Duke University who, at the beginning of his final semester, lacks no more than 9 semester hours of fulfilling the requirements for the A.B. or B.S. degree, may obtain permission from the Dean of the Graduate School to enroll for graduate courses sufficient to bring his total program to fifteen hours a week. Such graduate courses will be credited toward the A.M., M.S., M.Ed., or M.A.T. degree, provided that the student meets the requirements for admission to the Graduate School, and that he is duly registered in the Graduate School at the beginning of the semester in which he intends to earn graduate credit.

Duke undergraduates in the Honors-Masters program provisionally may be granted this type of admission at the beginning of their seventh semester provided that at the beginning of their final semester they will

meet the requirement stated above.

(2) Transfer of Graduate Credits. Credit for graduate course work earned at another institution will be determined only after a student has spent one semester at Duke University. After completing his first semester, the student through his Director of Graduate Studies should file

a request that his credits be reviewed and a decision be made.

(3) Graduate Credit for Courses Taken in the School of Law. Upon the recommendation of the Director of Graduate Studies, and upon the approval of the Dean of the Graduate School, students in the social sciences may take certain courses in the School of Law for graduate credit. In some instances courses in the School of Law may be considered as fulfilling a student's requirements for a minor. To register for such courses, the student should present a letter from his Director of Graduate Studies to the Dean of the School of Law requesting permission to

register for certain specified courses.

(4) Reciprocal Agreement with the Consolidated University of North Carolina. Under a plan of co-operation between the University of North Carolina and Duke University, students regularly enrolled in the Graduate Schools of the University during the regular academic year, and paying full fees to that institution, may be admitted to a maximum of two courses per semester in the Graduate School of Duke University upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. Under the same arrangements, students in the Graduate School of Duke University may be admitted to course work at the University of North Carolina. A similar arrangement is effective in the Summer Session. (See the Summer Session Bulletin.)

Grades

Grades in the Graduate School are as follows: E, G, S, F, and I. E (exceptional) is the highest mark. G (good) and S (satisfactory) are the remaining passing marks. F (failing) is below passing, and I (incomplete) indicates that some portion of the student's work is lacking, for an accept-

able reason, at the time the grades are reported. The instructor who gives an I for a course specifies the date by which the student must have made up the deficiency, in no case more than one calendar year from the date the course ended. If the course is not completed, the grade of F is entered upon the student's record unless his appeal to the Dean for the grade No Credit is approved. The grade of Z indicates satisfactory progress at the end of the first semester of a two-semester course. It will be changed to whatever grade is appropriate upon the completion of the course. A grade of F in a major course normally occasions withdrawal from a degree program not later than the end of the ensuing semester or term; a grade of F in a minor course occasions academic probation.

Courses Primarily for Undergraduates

Students granted provisional admission and others whose preparation is found deficient may on occasion be required as part of their program to take undergraduate courses as prerequisites to continued graduate study. Undergraduate courses thus taken and others elected by the student

will carry no graduate credit.

In exceptional cases, 100-level courses outside the major department may be taken for graduate credit to a maximum of two one-semester courses or one year-course not exceeding a total of 8 units, when approved by the Directors of Graduate Studies in the major department and in the department in which the course is listed and by the supervisor of the program.

Withdrawal and Interruption of Program

From a Course. For permissible changes during the first thirty days after the registration date, see Change of Registration, page 50. If a course is dropped without the necessary approval, the permanent record will list the course as Dropped Unofficially, F. If a course is dropped after the thirty-day period, the status of the student at the time of withdrawal from the course will be determined and be indicated on the permanent record

as Withdrew Passing (W.P.) or Withdrew Failing (W.F.).

From the Graduate School. The University reserves the right, and matriculation by the student is a concession of this right, to request the withdrawal of any student whose conduct at any time is not satisfactory to the University, even though no specific charge be made against the student. If a student wishes for any reason to withdraw from the Graduate School, he should notify both the Director of Graduate Studies in his major department and the Dean of the Graduate School prior to the date of his expected withdrawal. (For refunds upon withdrawal, see above, p. 42.) For withdrawal occasioned by academic failure see above.

Students who find it necessary to interrupt their program of study for a period longer than a summer vacation should, before departure, leave with the Graduate Office a statement of the reason for interruption, mailing address, and expected date of return. If they are subject to registration in absentia, they should arrange for such registration before

departure.

A foreign student who after successfully completing a minimum of one semester's graduate study must withdraw for the purpose of returning home before the completion of a graduate program may with the approval of his major department request the Dean to issue him a Certificate of Graduate Study.

Size of Classes

Classes which carry graduate credit are limited in size to thirty students. In exceptional cases this regulation may be modified, but only by permission of the Executive Committee of the Graduate School Faculty on the recommendation of the department concerned. When graduate students are enrolled in senior-graduate courses numbered from 200 through 299, such courses may enroll no more than three juniors, who at the time of registration must have an overall B average. Beyond this limit may be enrolled a total of three juniors who have been granted Advanced Placement in the subject.

Language Requirements

Because a requirement for the A.M. degree is mastery of one acceptable foreign language, and for the Ph.D. is mastery of two, the prospective graduate student should attain mastery of at least one acceptable foreign language and preferably two before applying for admission. The facilities for graduate study are highly specialized and costly. The student who must lay them aside to acquire what he could have learned as an undergraduate is wasting his time.

To prevent delay in meeting this requirement, students whose programs call for mastery of French, Spanish, or German and who have studied the language must take the objective screening examination at their first

registration period.

Acceptable Languages

The languages normally required are French, German, and Russian, but with the approval of the Dean of the Graduate School, a student may substitute for any one of these another language including an ancient language in the doctoral program which has a definite relation to the candidate's program of work for the degree and for which an examination can be provided. Individual departments are free to specify which languages they require, and they may require more than two.

Meeting the Requirements

Language requirements may be met before, during, or after first registration here in the following ways:

Before First Registration. 1. By ETS Scores. Educational Testing Service Graduate School Foreign Languages tests in French, German, and Russian are offered at many centers including Duke University Counseling Center upon nationally uniform dates. Scores on these tests taken elsewhere not more than five years before first registration here may be offered to meet the master's degree requirement of one language or the

doctoral requirement of two.

2. By Transcript. With the permission of the Dean of the Graduate School and of the chairman of his program committee or of the Director of Graduate Studies, the doctoral student may file a transcript or other certification as evidence of having passed a comparable examination, other than an ETS test, at another graduate institution. The limitations are that (1) only one of the two doctoral requirements may be met in this way, (2) the other institution offers a doctoral program in the student's major and that the examination would have met a doctoral requirement there, and (3) the examination was passed no more than five years before first registration here.

At First Registration. On Monday of the fall registration period and on the day before spring registration, objective reading, grammar, and vocabulary tests in French, German and Spanish are offered (see the Calendar for hour and place). Any entering student in the master's or doctoral program may take them. On the basis of his scores the student will be (1) certified as meeting requirements in these languages, (2) advised after review to present himself for the ETS tests (French, German) or the locally-prepared reading test in Spanish, or (3) advised to enroll in the

special reading course (see below).

After First Registration. 1. Students who first registered in September 1964 and thereafter and who wish to be examined in French, German, or Russian will take the ETS tests. For Spanish they will take the locally-

prepared reading test.

2. Students who began a program before September 1964 may take either the ETS tests or the locally-prepared reading tests in French,

German, Russian, Spanish, and, upon request, Italian.

Reading examinations in other languages must be individually arranged, after approval of the language by the Dean. Each ETS examination requires a fee of \$8. The student who requires a re-examination in the locally prepared reading examination at scheduled times will be charged \$5 for each re-examination; if special times are necessary, the fee will be \$10. Examinations at special times cannot be offered in French and Spanish.

Special Reading Courses

Special courses designed to assist graduate students in acquiring a reading knowledge of French or German are offered for three hours a week, French during the fall semester and occasionally also in the spring, German during the spring semester and the Summer Session. A student who registers for either course must reduce his normal load of graduate courses by three units, with no reduction in fees. *No auditors* are permitted in these courses at any time. Undergraduates may not enroll during the academic year and may, with permission of the Dean of the Graduate School, in the Summer Session only if total registration permits.

Requirements for Foreign Students

Foreign students whose native language is not English are, during their first registration period, required to take a test for minimum competence in English (see p. 39). Such students, with the approval of the Director of Graduate Studies in their major department, may request permission of the Dean of the Graduate School to substitute English for the one foreign language required in the master's program or for one of the two in the doctoral program. If permission is granted, an additional advanced-level reading test in English will be arranged.

Graduate Study in the Summer Session

The Summer Session of Duke University is divided into two terms. In 1967 the first term will begin on June 12 and will end on July 18. The

second term will begin on July 20 and will end on August 25.

Graduate students who wish to work toward advanced degrees in the Summer Session, particularly in chemistry, economics, education, English, history, mathematics, religion, sociology, Spanish, and zoology, will find a selection of courses offered by members of the Duke faculty and by visiting professors. Other departments ordinarily offering work leading to the A.M. degree are botany, political science, and psychology. Thesis research for advanced graduate students is available also in other departments, such as botany, engineering, forestry, and physics.

Requirements for admission to the Graduate School are detailed above. Students who wish to be admitted to the Graduate School for work in the Summer Session should make application to the Dean of the Graduate School, as well as to the Director of the Summer Session, and should return the completed application, with supporting documents, before May 12, for admission to the first term, and before June 20, for admission to

the second term.

Regulations Regarding Summer Work

(a) No graduate student may register for more than six units of credit in one Summer Session term. (b) All of the work required for the A.M.,

M.A.T., or M.Ed. degree must be completed within six years of the date of beginning. (c) Not more than one year of summer work can be accepted toward the residence requirements beyond the minimum for the Ph.D. or Ed.D. degrees. See p. 50 for a definition of a year's residence credit earned in Summer Sessions. Students who complete in a summer session the work required by the University for the Master's degree will be granted the degree in September.

A Summer Session Bulletin containing information about graduate courses may be obtained by addressing a request to the Director of the

Summer Session, Duke University, Durham, N. C.

Courses of Instruction

In general, courses with odd numbers are offered in the fall semester, those with even numbers in the spring semester. Double numbers separated by a hyphen indicate that the course is a year-course and must normally be continued throughout the year if credit is received. A student must secure written permission from the instructor in order to receive credit for either semester of a year-course. Double numbers separated by a comma indicate that although the course is a year-course, credit may be received for either semester without special permission.

Normally, courses which bear no date are offered every year; those

marked with an asterisk are offered only when the need arises.

Note: In each department the number 399 is reserved to designate special (individual) readings in a specified area and supervised by a regular member of the Graduate staff, credit 1-3 units each registration, 9 units maximum in three successive registrations. The course is restricted to resident master's and doctoral programs, must have a completion exercise, and must carry a grade. When used it appears in this form: [Department] 399, Special Reading in [area], (Instructor), [1 to 3] units.

Anatomy

Professor Markee, Chairman; Associate Professor Duke, Director of Graduate Studies (431 Medical School); Professors Everett, Moses, Robertson and Peele; Associate Professors Becker, Buettner-Janusch.

The Department of Anatomy offers graduate courses and training leading to the A.M. and Ph.D. degrees. Further information may be obtained

from the Director of Graduate Studies of the department.

M201. Anatomy as Related to Locomotion. Complete dissection of that part of the body concerned with locomotion and posture. (See also Course M205). Feb.-June. Prerequisite: One year each of biology, chemistry, and physics. 2 units. Professors Markee and Everett; Associate Professor Duke (Not 1967-1968)

M202. Microscopic Anatomy. Conferences and laboratory work on the morphological characteristics of the tissues of the animal body. The work is based upon a study of fresh and prepared material and is approached from the physiological viewpoint. Sept. to Jan. Hours and credits (maximum 3 units) by arrangement. Prerequisite: adequate training in histology or cytology. Professors Moses and Robertson; Associate Professor Becker

M203. Anatomy of the Nervous System. A study of the gross and microscopic structure of the human central nervous system, special attention being paid to the structural and functional relationships between the various nuclei and fiber tracts. Sept.-Jan. Hours and credits (maximum 3 units) by arrangement. Prerequisite: Gross Anatomy. Professor Peele

M204. Neuroanatomical Basis of Behavior. A study of the gross and microscopic anatomy of the nervous system with emphasis on the structural and functional relationship between tracts, nuclei, and cortical areas. Restricted to graduate students with the equivalent of a major in psychology. (Sept.-Jan.) 3 units. Professor Peele

M205. Anatomy of the Viscera. This is a study of the gross anatomy of the thoracic, abdominal and pelvic organs and the deeper structures of the head. Sept. to Jan. Prerequisites one year each of physiology, chemistry, and physics. 6 units. Professors Markee, Everett; Associate Professors

Becker and Duke (Not 1967-1968)

M231. Physical Anthropology. A survey of the major developments of physical anthropology. Human evolution, primate phylogeny, paleontology of man and other primates, primate biochemical genetics, primate behavior, human variation (genetic and somatic) are the principal topics of the course. Prerequisite: Core course in Anatomy. 3 units (2 hours of lectures each week, from September to January). (Listed also as Anthropology 231.) Associate Professor Buettner-Janusch

M232. Human Genetics. Particular emphasis upon the uniqueness of studies in human genetics, human biochemical genetics, human population genetics. Prerequisites: Anatomy 231, Zoology 131 (or an elementary course in biology including genetics) or permission of instructor. Feb.-June. 3 units. (Also listed as Zoology 232). Associate Professor

Buettner-Janusch

M244. Topics in Cell Structure and Function. Advanced discussions

of selected problems such as chromosome structure, mitosis, and cytological aspects of inheritance and development. Feb. to June. (1968 and alternate years). 2 units. Prerequisite: Zoology 243 (Botany 243) or equivalent and permission of instructor. (Listed also as Zoology 244.)

Associate Professors Moses (Anatomy) and Nicklas (Zoology).

M301. Gross Human Anatomy. A course especially for Ph.D. candidates in Anatomy, comprising a complete dissection of the cadaver. The laboratory work is supplemented by conferences which place emphasis on the biological aspects of the subject. Sept. to June. Hours and credits (maximum 8 units) by arrangement. Prerequisite: adequate training in comparative anatomy and embryology. Professors Markee and Everett; Associate Professors Becker and Duke

M312. Research. Individual investigations in the various fields of anatomy. Credits to be arranged. Professors Robertson, Markee, Everett, Peele and Moses; Associate Professors Becker, Buettner-Janusch,

and Duke

M313-314. Anatomy Seminar. Weekly meeting of graduate students and staff in which current research problems in Anatomy will be presented. Required of all graduate students who are candidates for the A.M. or Ph.D. degree. 2 units. Sept. to Jan. Professors Robertson, Markee, Everett, Peele, and Moses; Associate Professors Becker, Buettner-Janusch, and Duke

M378. Reproduction. A lecture and laboratory course dealing with mammalian reproduction. The rat and rabbit will serve as the principal laboratory subjects. The following areas will be covered: embryology of the reproduction system; gonadal structure, gametogenesis and hormone production; structure and function of the diencephalic-pituitary system; structural, chemical and behavioral actions of sex hormones; mechanisms of fertilization and implantation; placental structure and function; lactation. Feb. to June (1968 and alternate years). 4 units. Admission with approval of instructors. (Listed also as Physiology 378.) Professor Everett (Anatomy); Associate Professor Kostyo (Physiology).

Art

Professors Hall, Heckscher (*Chairman*), Markman, and Patrick; Adjunct Professor Bier; Associate Professor Sunderland

No graduate degree is offered in this department, but the following courses are suggested as possible minors for students majoring in anthropology, history, literature, philosophy, religion, psychology, or sociology, or in any other interested department.

217. Aegean Art. A study of the problems of Aegean art as the forerunner of Greek art and in relation to the contemporary civilization of the

eastern Mediterranean world. 2 units. (w) Professor Markman

- 218. Early Greek Art. A study of the problems of the origin and development of Greek art in the Geometric period to the end of the Archaic. 3 units. (w) Professor Markman
- 221-222. History of Aesthetics. Theories of art and beauty in the western world from antiquity to the present. Some attention will be given to the developed theories of aesthetics in the Far East. 6 units. (ϵ) Professor Patrick
- 233. Early Mediaeval Architecture. The development of religious architecture from the time of Constantine to the end of the First Romanesque style in the third quarter of the eleventh century. 3 units. (E) Associate Professor Sunderland
- 234. Romanesque Sculpture. The development of sculpture in western Europe from the early Christian period through the culmination of Romanesque art in the west portal of Chartres Cathedral. 3 units. (E) Associate Professor Sunderland
- 239. Architecture of Britain. After a summary of recent archaeological activity in the British Isles, and a survey of Mediaeval building, the course deals principally with changing architectural problems and their solutions from the advent of the Renaissance onward. Attention is given to the interests of students majoring in history or literature. 3 units. (E) Professor Hall
- **240.** Architecture of North America. A study illustrating the transplanation of European architectural customs since the sixteenth century; the time-lag in transit and acceptance of later European developments; the gradual assumption of confident independence in design; and the emergence of international leaders in the United States. 3 units. (E) Professor Hall
- **249.** Pre-Columbian Art. A study of the architecture, sculpture, pottery, and other arts of the indigenous civilizations in Mexico, Central America, and the Andean region of South America before the Spanish conquest. 3 units. (w) Professor Markman
- **250.** Latin American Art. A study of the architecture, painting, and other arts of Latin America from colonial times to the present. Particular emphasis will be placed on the architecture of the colonial period. 3 units. (w) Professor Markman
- 251, 252. Research. A course designed to give instruction in methods used in the investigations of original problems. It is open to seniors by permission of the Director of Undergraduate Studies. 6 units. (E) Professor Heckscher
- 292. Research Problems in the Collections of the North Carolina Museum of Art. Students will meet once every week in the museum in Raleigh. Each student will submit a report on his particular research project. 3 units.* (E) Adjunct Professor Bier

Biochemistry and Nutrition

Professor Handler, Chairman (237 Bell Building); Associate Professor Fridovich, Director of Graduate Studies (244 Bell Building); Professors M. Bernheim, Davidson, Gross, Guild, Hill, Kamin, Tanford, Thiers, Wakil; Associate Professors Byrne, Kirshner, Lynn, McCarty; Assistant Professors Greene, Rajagopalan, Rosett, and Wheat

In the Department of Biochemistry graduate work is offered leading to the Ph.D. degree, with such areas of specialization as physical biochemistry, metabolic biochemistry, or genetics with emphasis on molecular genetic mechanisms. A brochure may be requested from the department which describes the departmental facilities, the staff, the Ph.D. program, the special trainee stipends which are available to Ph.D. candidates in Biochemistry, and an M.D.-Ph.D. program.

Prerequisites are specified for each course, but interested students who cannot meet the requirements may be admitted by permission of the

instructor.

For Seniors and Graduates

201. Introductory Biochemistry. Three lectures and one conference per week. A rigorous introduction to fundamental aspects of biochemistry which emphasizes chemistry of biologically occurring macromolecules, mechanism of enzyme action, energy transformations, metabolic path-

ways, and biochemical genetics. 6 units. Professor Handler

203. Chemistry of Natural Products. This course will emphasize the organic chemistry of carbohydrates, lipids and steroids; aspects of stereochemistry, conformational analysis and physical methods of structural investigation will be discussed. Prerequisite: chemistry through organic; Biochemistry 201 or its equivalent is suggested. 2 units. Davidson

204. Introductory Genetics. An introduction to genetic analysis with emphasis on the molecular basis of segregation, mutation, function and organization of the genetic material. 3 units. Professors Gross and Guild

206. Laboratory Methods in Biochemistry. A laboratory course emphasizing the procedures and instruments of biochemical research. Each technique is employed in the course of a classical experiment demonstrating an important biochemical finding. Because the experimental materials are labile, one full day per week is spent in the laboratory. Prerequisite: Biochemistry 201 or equivalent. 2 units. Assistant Professor Rosett

M 241. General Biochemistry. Four lectures and one conference per week. A rigorous introduction to fundamental aspects of biochemistry which emphasizes chemistry of biologically occurring macromolecules, mechanism of enzyme action, energy transformations, metabolic pathways and biochemical genetics. 4 units. *Professor Handler*

For Graduates

301. Energy Metabolism. A lecture and seminar course on the metabolism of carbohydrates, lipids and biological oxidations; emphasizing energy production and utilization. Prerequisites: Biochemistry 201, 203 suggested. 3 units. Professor Wakil and Assistant Professor Wheat

302. Nitrogen Metabolism. An intensive study, in lecture and seminar, of the metabolism of inorganic nitrogen compounds, proteins, and their component amino acids. Prerequisite: Biochemistry 201. 2 units. Professor Kamin, Associate Professor Kirshner and Assistant Professor Greene

304. Proteins and Enzymes. The chemical and physical properties of proteins and enzymes. Thermodynamics, kinetics, and mechanisms of enzymecatalyzed reaction. Prerequisites: Biochemistry 201 and physical chemistry equivalent to Chemistry 261-262. 4 units. Professors Tanford and Hill, and Associate Professor Byrne

315. Molecular Genetics. A lecture and seminar course on nucleic acids in biology with emphasis on the physical and chemical basis of their role as the structural units of heredity. Prerequisite: Biochemistry 201, 203 and 204 suggested. 2 units. *Professors Guild and Gross*

345-346. Biochemistry Seminar. Required of all graduate students majoring in biochemistry. 1 unit each semester. Associate Professor Kirshner

348. Special Topics.* A lecture series on topics of current interest in biochemistry. 1 or 2 units. Associate Professor McCarty

351-352. Genetics Seminar. Required of all students specializing in genetics. 1 unit each semester. Professor Gross and staff

Botany

Professor Johnson, Chairman (141 Biological Sciences Building); Professor Billings, Director of Graduate Studies (142 Biological Sciences Building); Professors Anderson, Harrar, Hellmers, Kramer, Naylor, Oosting, and Perry; Associate Professors Culberson, Philpott, Stone, and Wilbur; Assistant Professors Searles and White

Graduate work in the Department of Botany is offered leading to the A.M. and Ph.D. degrees. Before undertaking graduate study in botany a student should have had in his undergraduate program at least 12 semester hours of botany beyond an elementary course, and related work in biological sciences. Some work in chemistry and physics will be desirable and, for some phases of botanical study, a necessity. Graduate

Record Examination scores are required of all applicants. The student's graduate program is planned to provide a broad basic training in the various fields of botany, plus intensive specialization in the field of the

research problem.

202. Genetics. The principles of heredity, their cytological basis, and their bearing on other fields of biology. Laboratory work involves experimental breeding of the fruit fly and interpretation of data from the breeding of plants. (Offered in alternate years.) Prerequisites: one year of botany, zoology, or equivalent, and one year of college mathematics. 4 units. Professor Perry

205. Anatomy. Intensive survey of vascular plant cell types, tissues and organs, with emphasis on the modern application of anatomy to problems of systematics and phylogeny. Laboratories will include microtechnique. Special project and term paper stressing current techniques and literature required. Prerequisite: Permission of instructor. 4 units. Assistant Pro-

fessor White

209. Lichenology. The morphology, systematics, and biological and ecological implications of the lichens. Collection and identification of specimens and the use of lichen chemistry in taxonomy. Prerequisite: Two semesters of botany. 3 units. Associate Professor Culberson

210. Bryology. The morphological, systematic, and ecological character-

istics of mosses and liverworts. 3 units. Professor Anderson

212. Phycology. The morphological and ecological characteristics of the common freshwater and marine species and the principles underlying their classification. Collecting, identification, and the making of permanent microscopical preparations. 3 units. Assistant Professor Searles

221. Mycology. Field and laboratory study of the vegetative and reproductive structures of the fungi and slime molds. Methods of collection, isolation, propagation, and identification of the major orders as represented in the local flora. Prerequisite: one year of biological science. 4

units. Professor Johnson

225-226. Special Problems. Students with adequate training may do special work in the following: (1) Mycology and Plant Pathology, (2) Cytology, (3) Ecology, (4) Genetics, (5) Morphology and Anatomy of Higher Groups, (6) Morphology and Taxonomy of Lower Groups, (7) Physiology, (8) Taxonomy of Higher Groups, (9) Microbiology, (10) Experimental Taxonomy and Evolution, (11) Phycology. Credits to be arranged. All Members of the Graduate Staff

240. Evolution. Microevolutionary change and factors influencing its rate and direction, with primary emphasis on examples from the plant

world. 3 units. Associate Professor Stone

242. Systematics. A general survey of the principles of vascular plant taxonomy, with practice in identification and collection. Special project or term paper required. Lectures, laboratories, and field trips. Prerequisite: Permission of instructor. 4 units. Associate Professor Wilbur

laboratories and field trips. Prerequisite: Permission of instructor. 4

units. Associate Professor Culberson

246. Ecology. Intensive study of the environmental effects on growth and distribution of plants at the level of the individual, the population, and the ecosystem. A term paper will be required. Lectures, laboratories and field trips. Prerequisite: Permission of instructor. 4 units. Professor Billings

251. Physiology. A general survey of the major physiological processes in plants, including food syntheses, growth and water relations. Special project and term paper required. Lectures, laboratories, and readings. Prerequisite: Permission of instructor. 3 units. Professor Kramer

252. Plant Metabolism. The physiochemical processes and conditions underlying the physiological processes of plants. Prerequisite: Botany 151 or equivalent; organic chemistry recommended. 4 units. Professor Naylor

254. Plant-Water Relations. A study of factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Assigned readings, reports, and lectures. Prerequisite:

Botany 151 or equivalent. 3 units. Professor Kramer

255. Plant Systematics. A study of the historical background of plant taxonomy, modern concepts and systems of classifications, nomenclatorial problems, and the taxonomy of specialized groups. Prerequisite: Botany 52 or equivalent. 4 units. Associate Professor Wilbur

256. Community Analysis and Classification. The development of concepts and methods in synecology and their present application to the study of plant communities. Prerequisite: Botany 156 or equivalent. 3

units. Professor Oosting

257. Principles of Plant Distribution. Interpretation of floristic and ecological plant geography of world vegetation. Prerequisite: Botany 156

or equivalent. 3 units. Professor Billings

258. Physiology of Growth and Development. Consideration of the internal factors and processes leading to the production of new protoplasm and its differentiation at the cellular, tissue, and organ level in plants. Prerequisites: Botany 151 or equivalent; organic chemistry recommended. 4 units. Professor Naylor

259. The Environment. Environmental principles; methods of obtaining and evaluating environmental data for ecological purposes with special attention to instrumentation and microclimate. Prerequisite:

Botany 156 or equivalent. 3 units. Professor Billings

305. Vegetation of North America. Distribution and limits of the major plant communities, a study in ecological plant geography. Prerequisite:

Botany 156 or equivalent. 3 units. Professor Oosting

359-360. Research in Botany. Individual investigation in the various fields of botany. Credits to be arranged. All Members of the Graduate Staff

243. Cytology. The structure and functional organization of cells. Lectures, readings, and laboratory work. Prerequisite: one year of botany or zoology. (Listed also as Zoology 243.) 4 units. Professor Anderson and Associate Professor Nicklas

245. Morphology. Comparative survey of vegetative organization and reproductive cycles in the modern flora, with emphasis on evolutionary origin and phylogeny. Special project and term paper required. Lectures,

Marine Laboratory

Four marine botany courses are given in the Duke University Marine Laboratory, Beaufort, N. C.; S205, Marine Microbiology (Not 1967); S207, Marine Mycology (Not 1967); S211, Marine Phycology; S220 Coastal Field Botany.

Chemistry

Professor Bradsher, Chairman (115 Chemistry Building); Associate Professor Quin, Director of Graduate Studies (09 Chemistry Building); Professors Brown, Hauser, Hill, Hobbs, Krigbaum, Strobel, and Wilder; Associate Professors Chesnut, Poirier, and Smith; Assistant Professors Jeffs, Jones, Palmer, Toren, and Wells; Adjunct Professor Peterlin

In the Department of Chemistry graduate work is offered leading to the A.M. and Ph.D. degrees. Before undertaking a graduate program in chemistry, a student should have taken an undergraduate major in chem-

istry, along with related work in mathematics and physics.

Graduate courses in the department are designed to provide a broad basic training in the fields of inorganic, organic, analytical, and physical chemistry. An important requirement for the Ph.D. degree is the successful completion, under the direction of a member of the staff, of a research program leading to the solution of an original problem. The choice of the research problem, for either the A.M. or the Ph.D. degree, will determine the field of advanced specialization.

For Seniors and Graduates

216. Nuclear Chemistry. Elementary theory of nuclear reactions, properties of isotopes, and tracer techniques. Two lectures and three laboratory hours. Prerequisites: Introductory physics, analytical and organic chemistry. 3 units. Professor Hill

217. Inorganic Chemistry. An advanced study of bonding, structures, and reactions of inorganic compounds based on modern physical chemical concepts. Three lectures. Prerequisite: One year of physical

chemistry. 3 units. Assistant Professor Palmer

234. Chemical Instrumentation. Discussion of physico-chemical principles as applied to instrumental methods of analysis, illustrated by laboratory experiments with emphasis on methods involving electrical techniques. One lecture and three laboratory hours per week. Prerequisites: quantitative analysis and physical chemistry; the latter may be taken concurrently. 2 units. *Professor Strobel*

235. Advanced Analytical Chemistry. A theoretical and applied treatment of chemical kinetics, electrode processes, multistage separations, organic reagents, and functional group chemistry as related to modern analytical techniques. Prerequisites: Chemistry 132 and 162. 3 units.

Assistant Professor Toren

251. Qualitative Organic Analysis. Systematic identification of organic compounds based upon a study of physical and chemical properties. Infrared and ultraviolet absorption spectra are used in elucidation of structure. One lecture and three or six laboratory hours per week. Prerequisites: Quantitative Analysis and one year of organic chemistry. 2 or 3

units. Associate Professor Quin

252. Advanced Organic Preparations. A laboratory course designed to supplement the student's knowledge of fundamental organic processes by a selected group of laboratory exercises accompanied by oral discussions of techniques and theories pertinent to the experiments. Five hours laboratory and lecture, with lectures in alternate weeks. Prerequisites: Quantitative Analysis and one year of organic chemistry. 2 units. Professor Brown

253. Intermediate Organic Chemistry. An advanced study of the reactions of organic compounds and the theories of organic chemistry. Prerequisite: one year of organic chemistry. 3 units. Professor Wilder

255. Structural Analysis by Spectroscopic Methods. A study of the use of ultraviolet, infrared, nuclear magnetic resonance and mass spectroscopy as applied to the determination of the structure of organic com-

pounds. 2 units. Assistant Professor Jeffs

263. Thermodynamics. Review of classical thermodynamics, including application of chemical potentials to the treatment of equilibria in multicomponent systems. Elementary statistical thermodynamics; use of partition functions for the ideal monatomic gas, harmonic oscillators, and rigid rotators. Derivative of Debye-Hückel equation; special topics. Prerequisites; one year of physical chemistry and one year of calculus. 3 units. Professor Krigbaum

267. Introductory Quantum Chemistry. Fundamentals of quantum mechanics and orbital methods of molecular structure and spectra. 3

units. Assistant Professor Jones

271. Introduction to Research. Lectures on the use of chemical literature, research methods, recording and publication of results, and other topics. One lecture per week. 1 unit. Professor Brown

275, 276. Research. The aim of this course is to give instruction in

methods used in the investigation of original problems. Individual work and conferences. 1 to 6 units. All Members of the Graduate Staff

For Graduates

306. Special Topics in Physical Chemistry. An introduction to the theory and to the application to physico-chemical problems of statistical thermodynamics, molecular spectroscopy, nuclear and electron magnetic resonance spectroscopy, intra- and inter-molecular interactions, and other selected topics.

Registration for other than chemistry graduate students by permission

of the instructor. 3 units. Professor Hobbs

315. Advanced Inorganic Chemistry. Intensive treatment of a few particular areas of modern inorganic chemistry. Mechanisms of inorganic reactions and solid state chemistry are included, but topics to be considered may be chosen to suit the interests of the group. Prerequisite: Chemistry 217. 3 units. Professor Wells

317, 318. Seminar in Inorganic Chemistry. Lectures, oral reports, and discussion on advanced topics and recent advances in the field of inorganic chemistry. Prerequisite: Chemistry 217. 2 units. Professors

Hill and Wells

331, 332. Seminar in Analytical Chemistry. A survey of the current literature of Analytical Chemistry and discussion of special topics. Prerequisites: Chemistry 234. 2 units. Professors Strobel and Toren

350. Organic Reactions. A study of the scope and limitations of the more important types of reactions of organic chemistry from the point of view of their practical use in the synthesis of organic compounds. Prerequisite: Chemistry 253. 2 units. Professor Bradsher

352. Mechanisms of Organic Reactions. Consideration is given to principles, theories and mechanisms of organic reactions effected by basic and acidic reagents. Usefulness of certain reactions in synthesis is discussed. Prerequisites: Chemistry 253. 2 units. Professor Hauser

354. Stereochemistry. A study of recent advances in stereochemistry of organic compounds including conformations and stereospecific reactions. The use of spectrophotometric methods for the determination of structure will be discussed. Prerequisites: Chemistry 253 and 255. 2 units. Professor Wilder

355. Special Topics in the Chemistry of Natural Products. A study of the structure and biosynthesis of natural products with particular emphasis on recent advances in the field of alkaloid chemistry. Prerequisites: Chemistry 255 and 354. 2 units. Assistant Professor Jeffs

356. Heterocyclic Chemistry. A study of synthetic methods and physical and chemical properties of selected families of heterocyclic com-

pounds. 2 units. Associate Professor Quin (Not 1967-68)

360. Polymer Chemistry. A survey of the methods of preparation of

high-molecular-weight organic compounds and a study of the properties characteristic of macromolecules in solution and in the solid state. Pre-

requisite: Chemistry 263. 2 units. Professor Krigbaum

361. Advanced Polymer Chemistry. A number of topics in the chemistry and physics of high polymers will be discussed, including polymerization mechanisms and kinetics, crystallization and morphology of high polymers and solution properties. Prerequisite: Chemistry 360. 2 units. Adjunct Professor Peterlin

362. Kinetics of Chemical Reactions. A presentation of the more important facts and theories relating to the rates with which chemical reactions occur in the gas phase, in solution, in the solid state, and at phase interfaces. Prerequisite: Chemistry 263. 3 units. Associate Pro-

fessor Smith (Not 1967-68)

364. Advanced Topics in Physical Chemistry. A presentation of one or more topics in the field of physical chemistry of special interest to the faculty. Prerequisite: Chemistry 263. 2 units. Physical Chemistry Staff

(Not 1967-68)

365. Introductory Statistical Mechanics. Fundamentals of classical and quantum statistical mechanics. Intermediate statistical thermodynamics. Ensemble theory. Statistical theories of solids and lattices. Prerequisites: Chemistry 263 or 267. 3 units. Physical Chemistry Staff

366. Statistical Mechanics. Statistical mechanics of systems of strongly interacting elements; theories of fluids and solutions. Selected advanced topics: distribution function methods; graph-theoretical methods. Prerequisite: Chemistry 365. Corequisite: Mathematics 285. 3 units. Associate Professor Poirier (Not 1967-68)

368. Quantum Mechanics. Molecules in electromagnetic fields, group methods, electron correlation. Prerequisite: Chemistry 267. Corequisite:

Mathematics 285. 3 units. Associate Professor Chesnut

373, 374. Seminar. Required of all graduate students in chemistry. One hour a week discussion. 2 units. All Members of the Graduate Staff

Classical Studies

Professor Richardson, Chairman and Director of Graduate Studies (312 Carr); Professors Rogers, Truesdale, and Willis; Visiting Professor (second semester) Marti; Assistant Professors Stanley, Womble, and

Wooley.

The Department of Classical Studies offers programs leading to the M.A. (and M.A.T.) and Ph.D. degrees with majors in Greek, Latin, and Ancient History and minors in these, Archaeology, and Linguistics. For regular admission to a major in Greek or Latin a student must offer three years of college study above the elementary level in one language and two college years in the other. Students wishing to major in Ancient

History will be required on entrance to demonstrate satisfactory competence in both Greek and Latin for reading in the primary sources; failure to demonstrate such competence will require modification of the

student's program to repair deficiency.

The Department's special requirements of students in addition to the general requirements of the University for the M.A. set forth on pages 6-7 of this Bulletin and for the Ph.D. set forth on pages 12-15 of this Bulletin are presented in a sheet which may be obtained from the Director of Graduate Studies. They include for the M.A. a major and a minor field and for the Ph.D. a major and two minor fields, all to be chosen within the general discipline of Classical Studies; an Introductory Colloquium at entrance; a reading list; a comprehensive examination at the end of the first year of residence; and special requirements in seminar and course work and in the preliminary examination for the Ph.D. degree.

Greek

For Seniors and Graduates

203. Homer. Extensive readings in the Iliad and Odyssey, with emphasis on the problems of the language and structure in the epic, together with a survey of the present state of Homeric scholarship. 3 units. sistant Professor Stanley

205. Greek Lyric Poets. A study of the fragments of the early lyric poets, with concentration on selected odes of Pindar and Bacchylides. 3

Professor Truesdale

221. Early Greek Prose. A study of the development and progress of Greek prose in the fifth century from the Ionian scientists and logographers to Herodotus; a close study of Gorgias, Antiphon, and Old Oligarch. 3 units. Professor Willis

225. Plato. Study of selected dialogues and related passages chosen to illustrate the development of philosophical topics and stylistic motifs. 3

Assistant Professor Wooley

For Graduates

301. Greek Seminar I. 3 units. Graduate Staff

Latin

For Seniors and Graduates

201. The Verse Treatise. The genre of didactic poetry, with special emphasis on Lucretius' De Rerum Natura, Vergil's Georgics, and Ovid's Ars Amatoria; some attention will also be given to Cicero's Aratea, the Astronomica of Manilius, Horace's Ars Poetica, and Ovid's Fasti. 3 units. Professor Richardson

205. Mediaeval Latin I. Latin literature of late antiquity from Pru-

dentius to the Carolingian Revival. 3 units.

206. Mediaeval Latin II. Literature in Latin from Charlemagne to the

Renaissance. 3 units.

210. Lyric and Occasional Poetry. Selective study of the shorter verse forms employed by Latin poets, among them the epigram, the pastoral, the song, and the panegyric. 3 units. Assistant Professor Womble

211. Roman Oratory I. The literary history and criticism of Roman oratory, centering about the Brutus of Cicero. 3 units. Professor

Rogers

212. Roman Oratory II. A continuation of Latin 211. Tacitus' Dialogus

follows completion of Cicero's Brutus. 3 units. Professor Rogers

241. Advanced Latin Composition. Experiments in imitation of the great Latin prose styles and introduction to the composition of verse. 1 unit. Professor Richardson

301. Latin Seminar I. 3 units. Graduate Staff

Classical Studies

For Graduates

301. Introduction to Classical Philology. Introduction to the bibliography and principal disciplines of the field. 3 units. Professor Willis and Graduate Staff

Classical Studies (Ancient History)

For Seniors and Graduates

253. Greece to the Orientalizing Period. 3 units.

254. The Age of the Tyrants and the Persian Wars. 3 units.

257. Social and Cultural History of the Hellenistic World from Alexander to Augustus. Lectures, reading, and discussions. This course will not be separately credited without the sequel Cl.St. 258. 3 units. Pro-

fessor Rogers (Not 1967-1968)

258. Social and Cultural History of the Graeco-Roman World. The Roman Empire as the trustee of Hellenism and Christianity, and its own original contributions to modern civilization; lectures, readings, and discussions. This course continues Cl.St. 257 and will not be separately credited. 3 units. *Professor Rogers* (Not 1967-1968)

261. The Roman Revolution, 146-30 B.C. 3 units.

262. Rome under the Julio-Claudians. 3 units. Professor Rogers

For Graduates

321. Seminar in Ancient History I. 3 units. Graduate Staff

Classical Studies (Archaeology)

For Seniors and Graduates

231. Greek Sculpture. A study of the techniques and styles of the major schools and personalities in archaic, classical, and Hellenistic freestanding and architectural sculpture. 3 units. Assistant Professor Stanley

236. Roman Painting. Study of Roman pictorial art with concentration on the wall paintings from Campania, and especially Pompeii. Investigation of technique, iconography and its sources, pictorial composition, and the use of pictures in decoration. 3 units. Professor Richardson

For Graduates

311. Archaeology Seminar I. 3 units. Graduate Staff

Related Courses in Other Departments

Philosophy 217; Religion 217, 313, 316, 318.

Under the terms of a co-operative agreement, graduate students of Duke University may, with the approval of the chairman of their major department, take any graduate course offered by the Department of Greek and Latin of the University of North Carolina by the payment of a nominal fee. A list of these courses will be sent upon request.

Graduate students of Duke University may attend the American School of Classical Studies in Athens, Greece, without charge for tuition, and they are eligible to compete for the fellowships that are offered annually by the School. These consist of two fellowships in Greek archaeology, and one in the language, literature, and history of ancient Greece, each with a stipend of \$2,000. They are awarded mainly on the basis of examination held in the beginning of February of each year. A somewhat similar connection exists with the American Academy in Rome.

Comparative Literature

No graduate degree is offered in Comparative Literature. The following courses may serve in the minor programs of students in other departments. Professor Salinger is Chairman of the Department of Germanic Languages and Literature.

201, 202. Romanticism. Studies in the origin, rise and development of

the Romantic Movement in the chief literatures of the Western World. The approach is comparative; the principal emphasis will be on England, France, and Germany with some reference to other countries. Selected subjects will occasionally be covered in lectures by speakers from various departments of the University. 6 units. (Not 1967-68) Salinger

203, 204. Realism and Symbolism. Comparative studies in the literatures of England, France, Germany, Russia, the Scandinavian countries, Spain and Italy, tracing the decline of romantic individualism and the reappraisal of man's significance against the social background. Selected subjects will occasionally be covered in lectures by speakers from various departments of the University. 6 units. (1967-68) Professor Salinger 205. Foundations of Twentieth-Century European Literature. The roots

of the contemporary scene (Proust, Mann, Rilke, Kafka, Eyvind Johnson, Anouilh, Lagerkvist, Camus) evolving toward a mythology of man. 3

units.* Professor Salinger

Economics

Professor Smith, Chairman (306 Social Science); Professor Yohe, Director of Graduate Studies (313 Social Science); Professors Black, Davies, de Vyver, Ferguson, Hanna, Hoover, McGee, Rottenberg, Saville, and Spengler; Visiting Professor McColl; Associate Professors Blackburn, De Alessi, Goodwin and Navlor; Assistant Professors Condos, Finger, Vernon and Wallace

The Department of Economics offers graduate work leading to the A.M. and Ph.D. degrees. A student entering graduate work in economics should have completed with satisfactory grades at least 12 semester hours of undergraduate work in economics, including 6 hours of Principles of Economics. Among the undergraduate courses of distinct advantage to the graduate student in economics are General Accounting, Elementary Statistics, Intermediate Economic Theory, Money and Banking, International Trade, and basic courses in philosophy, psychology, mathematics, and social sciences other than economics.

Requirements for the Ph.D. in economics include a core of courses in Mathematical Economics, Statistical Methods, Micro- and Macroeconomic Theory, Monetary Theory, Economic History, and the History of Economic Thought. Economic Growth and Demography, Money and Banking, International Trade, Economic Systems, Labor Economics, Public Finance, Industrial Organization, and Econometrics are optional fields, of which the student elects at least three in preparation for the preliminary doctoral examination. Course requirements for the Ph.D., including a minor field, may be completed in four semesters of residence.

For Seniors and Graduates

218. Business Cycles. The characteristics and measurement of cyclical fluctuations in output, employment, and prices; an historical survey of business cycle theories, modern macroeconomic theory and public policy as they relate to business cycles and associated problems of economic growth; techniques of forecasting cycles. 3 units. Professor Yohe

233. State and Local Finance. A study of expenditures, taxation, and financial administration in state and local governments with emphasis on current problems. Special attention will be given to research methods and materials and to the financial relations between state and local govern-

ments. 3 units.* Professor Davies

237-238. Statistical Methods. A study of statistical methods appropriate for dealing with problems in business and the social sciences. In addition to developing more thoroughly the subject considered in Business Statistics, the following methods will be considered: multiple, partial, and curvilinear correlation; curve fitting; probability; sampling distributions; and statistical inference. Prerequisite: Economics 138 or consent of the instructor. Either semester may be taken for credit. 6 units. Hanna and Assistant Professor Wallace

243. Econometrics I. Economic theory, mathematics, statistical inference, and electronic computers applied to analysis of economic phenomena. Objective is to give empirical content to economic theory. Matrix algebra used to develop topics in inference, linear regression, and systems of simultaneous equations. Use is made of the electronic computer. 3

Associate Professor Naylor

244. Econometrics II. A course on the design of computer simulation experiments for economic systems. Topics include generation of stochastic variates, computer models of queueing and inventory systems, models of the firm and industry, models of the economy, simulation languages, and experimental design. 3 units. Associate Professor Naylor

262. Trade Unionism and Collective Bargaining. An intensive survey of the trade union as an economic institution is followed by a study of the principles and problems of union-management relationship as found in

collective bargaining. 3 units.† Professor de Vyver

265. International Trade and Finance. A study of the fundamental principles of international trade and foreign exchange. Subjects covered will include international specialization, balance of payments, foreign investments, tariffs and commercial policies, exchange control, exchange rates, and international monetary problems. 3 units. Assistant Professor Finger

275-276. Advanced Industrial Accounting and Management. A comprehensive examination of the rationale and techniques of control methods used in industry. Emphasis is laid on a critical evaluation of the practices followed by job-order, process, and standard costing, as well as the economics of overhead costs. Prerequisites: Economics 171-172 and per-

mission of the Department. 6 units. Professor Black

301. Economic Analysis. Review of contemporary theory relating to consumer behavior, production, the firm, price formation, income distribution, and equilibrium. 3 units. Professor Ferguson and Associate Professor De Alessi

304, 305. Seminar in Money and Banking. In the first semester, a survey of theories of the level and structure of interest rates and the relationships among the money supply, interest rates, income, and price levels; second semester, recent issues in monetary theory and monetary policy, particularly theories of credit rationing, the financial intermediaries controversy, and the monetary policy transmission mechanism. 3 units each. *Professor Yohe*

307. Quantitative Analysis, I. A systematic analysis of the principal quantitative methods used in microeconomic theory. Neo-classical theories of production and distribution are used as vehicles for presenting the material. Considerable emphasis is placed on the application of mathematical analysis to economic models. 3 units. Professor Ferguson

and Associate Professor Naylor

308. Quantitative Analysis, II. Linear economic models, particularly Leontief models, are used in the exposition. Primary emphasis is placed on the application of mathematics to economic theory. Prerequisite: Economics 307 or consent of instructor. 3 units. Professor Ferguson and Associate Professor Naylor

311, 312. History of Political Economy. A detailed review of the development of economic theory, the tools of economic analysis, and economics as a science, together with an analysis of the circumstances affecting this development. Period covered: pre-Christian times through 1936. 6 units.

Professor Spengler

- 313-314. Seminar in Economic Theory. The course consists of directed research in economic theory. The primary purpose is the correction of authoritative eclecticism and its replacement by individually integrated theory. Prerequisite: Economics 301 or its equivalent. 6 units. Professor Ferguson
 - 315. Seminar in Economic Systems. 3 units.

316. Seminar in Economic Functions of the State. 3 units.

317. Seminar in Demographic, Population, and Resource Problems. 3 units. Professor Spengler

319. Seminar in the Theory and the Problems of Economic Growth and

Change. 3 units. Professors Rottenberg and Spengler

320. Seminar in Trade Cycle, Employment, and Income Theory. 3 units. Professor Yohe, Associate Professor Blackburn, and Assistant Professor Condos

329. Federal Finance. An analysis of the trends and hypotheses con-

cerning the growth in governmental activity, the optimum level and composition of governmental spending, and the microeconomic and macroeconomic effects of governmental spending and tax policies. 3 units. *Professor Davies*

330. Seminar in Public Finance. 3 units. Professor Davies

331. Seminar in Economic History. 3 units. Professor Smith

340. National Income. A critical survey of the conceptual framework and structure of national income and its components, the reliability of national income estimates, and their use in analyzing questions of economic policy. 3 units.* Professor Hanna

355. Seminar in Labor Economics. 3 units. Professor de Vyver

358. Seminar in Labor Market and Related Analysis. 3 units. Professor Rottenberg

365. Seminar in International Economics. 3 units.

- 366. Seminar in Problems in International Trade and Finance. The seminar will discuss selected topics of current interest, such as the European Common Market, international commodity agreements, migration of labor, amending the IMF charter, and the U.S. gold drain. Prerequisite: Economics 365 or equivalent. 3 units. Visiting Professor McColl
- 386. Seminar in Latin-American Economic Problems. 3 units.* Professor Smith
- 388. Industrial Organization. The theory, measurement, and history of the firm-structure of industry. Emphasis upon the structure of American industry and upon actual production and pricing practices. Criteria for evaluating industrial performance. 3 units. ** Professor McGee and Assistant Professor Vernon**

389. Seminar in Industrial and Governmental Problems. 3 units.*

Professor McGee

401. Seminar on the British Commonwealth. 3 units. Professors Spengler, Cole, and Preston

Related Courses in Other Departments

Courses comprising a candidate's minor may be selected from fields of forestry, history, mathematics, philosophy, physics, political science, psychology, and sociology and anthropology, or from an area that complements the candidate's area of research interests in economics.

Education

Professor Nelson, *Chairman* (o8D West Duke Building); Professor Bolmeier, *Director of Graduate Studies* (o8D West Duke Building); Professors Bowman, Cartwright, Githens, Hopkins, Hurlburt, Petty, and Stumpf;

Associate Professors Colver, Gehman, Shuman, Spaulding, Sublett, and Weitz; Assistant Professors Ballantyne, Carbone, Martin, Simino; Lecturer Engelhart

For Seniors and Graduates

Graduate work in Education is offered leading to the A.M., the M.Ed., the M.A.T., the Ed.D., and the Ph.D. degrees. For each of these degrees there are specific requirements and prerequisites, all of which may be found stated in detail in this *Bulletin*, pp. 4-17. Department requirements and prerequisites for all of these degrees may be obtained from the Director of Graduate Studies.

From the courses listed below, plus several in related disciplines, a selection may be made which will meet North Carolina requirements for the Advanced Principal's Certificate and the Superintendent's Certificate.

(Some courses below are offered only in the Summer Session; see the

Summer Session Bulletin.)

These programs are accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers and school service personnel with the Doctor's

degree as the highest degree approved.

201. Teaching and Supervision of Arithmetic. This course gives special attention to the number system, the fundamental operations (with whole numbers, fractions, and decimals), percentage, and measurements. The course will consider the meaning theory, method of teaching, problem solving, evaluation, practice and drill, and selection and gradation of arithmetical contents. The course is designed for teachers and supervisors in the elementary school. 3 units. Professor Petty

203. Principles of School Administration. The fundamental facts and procedures of school administration, and analysis of the problems and policies of the organization and direction of a local school system, and the functions of the various school officials. 3 units. Professors Bolmeier,

Hurlburt, Nelson, and Stumpf

204. The School as an Institution. Consideration is given to the place of the school in the American social order, and its adaption to social, economic, and political changes. Special attention is directed to the responsibility (1) of the school for seeking solutions to the perplexing problems of youth created by a changing society; and (2) of the government for providing greater equality of educational opportunity. 3 units. Professors Bolmeier and Nelson and Assistant Professor Martin

205. Curriculum Problems in Secondary Education. A consideration of the aims and objectives of secondary-school subjects, emphasizing practical problems of curriculum-making in the high school. 3 units.* Profes-

sor Cartwright

206. Philosophical Analysis of Educational Concepts. A critical study of selected writings in philosophical analysis that bear on such educa-

tional concepts as "teaching," "understanding," "learning," "knowing," "explanation," and "education." Past authors include Plato, Augustine, Locke, and Dewey. Contemporary authors include W. Dray, W. B. Gallie, C. G. Hempel, D. J. O'Connor, R. S. Peters, I. Scheffler, and others. 3 units. Assistant Professor Carbone

210. Introduction to Educational Research. The general purpose of this course is to give the student an overview of research, acquaint him with the nature of research processes, and develop within him an appreciation of the essential characteristics of good research. 3 units.

Stumpf

211. The Problem Child. Study of problem behavior and adjustment in children with emphasis on the causes and treatment of conduct and neurotic disorders of the maladjusted child. Particular attention will be paid to mental hygiene principles in the handling of problem children in

school and home (also listed as Psychology S211). 3 units.

212. Statistical Methods for Educational Research. A review of the methods of descriptive statistics and an introduction to statistical inference are followed by applications of correlation techniques to problems of guidance and placement and of the elements of experimental design to instructional problems. Prerequisite: Education 210 or its equivalent. 3 units. Lecturer Engelhart

213. Elementary-School Organization and Administration. This course is designed especially for principals, teachers, and other prospective members of the elementary-school staff. The scope of elementary education is considered to encompass nursery school, kindergarten, and the elementary school. Special treatment is given to the problems of internal organization and management of the elementary school, and its integration with the secondary-school level. 3 units.* Professor Stumpf and Associate Professor Sublett

215. Secondary Education: Principles. Intensive study of principles, curriculum, and methods in secondary education. Accelerated course meeting six hours a week for half a semester. Must be accompanied by Education 216. 3 units. Professors Cartwright, Githens, Hurlburt, and

Nelson; Associate Professors Shuman and Sublett

216. Secondary Education: Internship. Supervised internship in junior or senior high schools. Full-time observation and teaching for half a semester, accompanied by Education 215; or, with permission of the Department, full-time teaching for a semester, accompanied by Education 315. Students carrying Education 216 for credit toward a master's degree will be required to take six hours of senior or graduate work in addition to the normal degree requirements. 6 units. Professors Cartwright, Githens, and Hurlburt; Associate Professors Shuman and Sublett

217. The Psychological Principles of Education. An advanced study of teaching, learning, and the learner. Selected problems guiding the reading of students will be discussed in class. 3 units. Associate Professors

Gehman, Spaulding and Weitz

223. Teaching the Language Arts. Comparison of current methods and materials in the teaching of handwriting, spelling, and oral and written composition. Analysis and correction of basic difficulties. Increasing opportunities for creative expression. Correlation of language arts with other activities and school subjects. 3 units.

224. Teaching the Social Studies in Elementary Schools. This course will treat objectives, curriculum trends, methods, and materials in elementary-school social studies. Topics to receive emphasis include unit-planning, use of the textbook, the reading program, using community resources, audio-visual materials, dealing with controversial issues, teaching time and place concepts, and evaluation. Opportunity will be provided for teachers to work on their own school problems in the social studies. 3 units. Professor Cartwright

225. The Teaching of History and the Social Studies. Evaluation of the objectives, content, materials, and methods in the teaching of history and

the social studies. 3 units. Professor Cartwright

226. Teaching Reading in the Elementary School. A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. 3 units.

232. Supervision of Instruction. The survey of supervision as a means of improving instruction and adapting the curriculum to the learner and to

community needs. 3 units.* Professor Hurlburt

233. Improvement of Instruction in English. This course will acquaint the student with recent developments in the teaching of English and will introduce him to research techniques in the field. Each student will pursue an extensive independent study based on his particular interests.

3 units. Associate Professor Shuman

- 234. Secondary-School Organization and Administration. This course is designed especially for principals, teachers, and other prospective members of the secondary-school staff. The scope of secondary education is considered to encompass junior high school, regular high school, senior high, and junior college. Special treatment is given to the problems of internal organization and management. 3 units. Professors Bolmeier and Nelson
- 236. Teaching Reading in the Secondary School. A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. The course provides practice with secondary-school children suffering reading retardation, including testing, diagnosis, and daily remedial teaching during a six-week period. For secondary-school teachers of all subjects who wish to improve the reading and study habits of their students. 3 units.

237. The Teaching of Literature in Secondary Schools. This course surveys the literature generally taught in secondary schools. Both adult and transition-type literature are considered. Methods of organizing the program and of teaching literature are explored. 3 units. Associate

Professor Shuman

238. Remedial Reading—Principles and Practice. A study of the basic causes of reading disability and of principles, methods, and materials for the diagnosis and correction of specific difficulties. The course provides practice with grade school children suffering reading retardation, including testing, diagnosis, and daily remedial teaching during the six-week period. A basic course in the psychology of teaching of reading is prerequisite, or Education 226 may be taken concurrently. 3 units.

239. The Teaching of Grammar, Composition, Mechanics and Usage in Secondary Schools. This course will be concerned with recent developments in the teaching of grammar, composition, mechanics, and usage. Students will write and grade compositions. Each student will undertake an appropriate term project. 3 units. Associate Professor Shuman

240. Educational and Occupational Information. A study of the sources of occupational and educational information: methods of securing and organizing occupational information; methods of providing vocational and educational information to students through career days, college conferences, class activities, and individual counseling; methods of making job analyses and community occupational surveys. 3 units. * Associate Professors Ballantyne and Colver

241. *Principles of Guidance.* An historical survey of the philosophies of guidance; a study of the interrelationships between instruction, administration, and guidance in education. Prerequisite: 6 hours of psychology or

educational psychology. 3 units. Associate Professor Colver

242. Measurement of Aptitudes, Interest, and Achievement. A study of the theories and principles of psychological measurement as applied to aptitude, interest, and achievement testing. Prerequisite: 12 hours of psychology or educational psychology (6 hours of which may be taken concurrently). 3 units.

243. Personality Dynamics. A study of personality structure and dynamics with emphasis upon the implications for counseling and instruction. Prerequisite: 6 hours of psychology or educational psychology. 3

units. Associate Professor Gehman

244. Counseling Techniques. A study of individual counseling techniques including diagnosis, interviewing, program planning, and counseling evaluation. Prerequisites: Education 243 and 258 or equivalent, which may be taken concurrently. 3 units. Associate Professor Gehman

246. The Teaching of Mathematics. This course deals with such topics as aims, curriculum, course and lesson planning, and classroom procedure for teaching secondary-school mathematics. 3 units. Associate Professor Reynolds

248. Practicum in Counseling. Practice in individual counseling, including test administration, intake interviewing, diagnosis, counseling, program planning, report preparation, and evaluation. The student will be expected to devote about 150 hours to case work and conferences with his supervisor. Prerequisite: Education 244. 3 units. Associate Professor Weitz

249. Introduction to Exceptional Children. Survey course in special education covering the educational, psychological, medical and social aspects of exceptional children. Field experiences including emotionally disturbed, mentally retarded, neurologically impaired, physically handicapped, crippling and special health conditions, socially and culturally deprived and gifted children. (Opportunities for attendance at psychiatric, psychological, and educational demonstrations with exceptional

children.) 3 units. Assistant Professor Stedman

250, 251. Teaching Emotionally Disturbed Children: Internship. Basic principles and practices in teaching and the organization of instructional materials. Work with children under the supervision of a certified teacher of emotionally disturbed children. Experience in general classroom teaching and small group and individualized instruction. Participation in staff conferences involving psychiatrists, psychologists, social case workers, and professional educators. 3 units each semester. Associate Professor Gehman

252. The School in the Legal Structure. Designed to show the legal relationships of the school to federal, state, and local governments. Considerable attention to legal rights, responsibilities, and liabilities of the

teacher. 3 units.* Professor Bolmeier

253. School Law. The primary purpose of this course is to familiarize prospective school administrators and teachers with the legal features of school organization and administration. Although some attention is given to constitutional and statutory provisions, the main emphasis is upon court decisions relating to education. Students are expected to select appropriate problems in school law for intensive study. 3 units. Professor Bolmeier

258. Educational Measurements. A critical study of the principles and techniques involved in measurement in education, with opportunity for individual research. Prerequisite: twelve semester hours in the Department, including a course in educational psychology. 3 units. Associate Professors Colver and Weitz

266. Science in the Elementary School. Presentation of basic concepts in natural and physical science through selected readings, the use of simple experiments and demonstrations, construction and use of equip-

ment, and field studies. 3 units.* Professor Githens

276. The Teaching of High-School Science. Discussion, lectures and collateral reading, related to such topics as aims, tests, curriculum, class-

room and laboratory procedure, field trips, course and lesson planning for

secondary-school science. 3 units. Professor Githens

285. Audio-Visual Aids in Education. The aims and psychological bases of audio-visual materials in the classroom. Attention to such materials as charts, filmstrips, flat pictures, maps, models, motion pictures, radio,

records, slides, and television. 3 units.*

290. Administration of School Property. Planning and management of the school plant and its equipment to meet instructional, health, and community needs for immediate and long-range purposes. This course is intended for teachers, principals, and superintendents. Areas to be treated will include site selection; trends in design, lighting, ventilation, and heating; custodial service and maintenance; and financing. 3 units.* Professor Stumpf

291. Public and Community Relations of Schools. A study of the relationships between the entire school or school system and the several publics, especially to the community of a given school. Media for interpreting needs and views of the school to the public and vice-versa will be explored. The study applies to both public and private schools. 3 units.

Professor Stumpf

For Graduates

315. Seminar in Secondary-School Teaching. Advanced-level consideration of principles, practices, and problems in secondary-school instruction. Designed particularly to accompany an internship. For students without previous internship credit, this course must be accompanied by Education 216. 3 units. Professors Hurlburt and Nelson

323. Public School Finance. A study of educational costs, sources of revenue for the support of public education, collection of revenue, basis of distribution, and accounting for funds spent. 3 units.* Professor

Stumpf

333. Seminar in Higher Education. An examination of current problems in American higher education, with special emphasis on case studies in organization, administration, and evaluation. For graduate students interested in the administration of higher education or college teaching with

consent of the instructor. 3 units. Professor Hopkins

335-336. Seminar in School Administration. Organization and control over public education. During first semester attention is given to governance of education as is exercised by the different branches and levels of government. Administrative organization is given consideration in the second semester. 3 units each semester. Professors Bolmeier, Hurlburt, Nelson, Petty, and Stumpf

337. Seminar in Community College Organization. Discussion of the nature, function and organization of community colleges. Research, writing, and reporting on selected problems. 3 units. Professor Hurlburt

338. Seminar in Educational Supervision. Open to students who have

completed Education 232 or its equivalent. 3 units. Professor Hurlburt 339. Seminar in Curriculum. Research, writing, and reporting on selected problems. 3 units. Professor Cartwright and Associate Professor Sublett

340. Seminar in Social Studies Curriculum. Research, writing, and reporting on selected problems. 3 units. Professor Cartwright

341. Seminar in Elemetary School Curriculum. Research, writing, and reporting on selected problems. 3 units. Associate Professor Sublett

350, 351. Directed Activities in School Administration. This course will satisfy, in part, requirements for the Superintendent's or Advanced Principal's Certificate. It involves work on an administrative project approved and supervised by the instructor. Open only to school administrators. 3 units each semester. Professors Bolmeier, Hurlburt, Petty, and Stumpf

354. Seminar in School Law. Open to students who have completed Education 253 or its equivalent and are working or plan to work on doctoral dissertations or masters' theses of a legal nature. Reports on research projects and recent court cases. 3 units.* Professor Bolmeier

Engineering

James Lathrop Meriam, Ph.D., Dean; Charles Rowe Vail, Ph.D., Associate Dean for Graduate Study and Research (136 Engineering)

The School of Engineering offers programs of study and research leading to the degrees of Master of Science with a major in civil, electrical, or mechanical engineering and Doctor of Philosophy with a major in civil or electrical engineering. These programs are designed to provide a fundamental understanding of the science of engineering, which is based on mathematics and the physical sciences, as well as a basic understanding of the art of engineering, which depends on human imagination and judgment. Each Engineering graduate student participates in seminars appropriate to his field of study.

A minimum of 30 units of earned graduate credit beyond the Bachelor's degree is required for the M.S. degree: 12 in engineering, 6 in related minor work (normally mathematics or natural science), 6 in either the major or minor subject or in other areas approved by the major department and the Dean of the School of Engineering, and for a research-

based thesis. There is no language requirement for this degree.

A minimum of 60 units of earned graduate credit beyond the Bachelor's degree is required for the Ph.D. degree: 24 in engineering, 12 in related minor work (normally mathematics or natural science), 12 in either the major or minor subject or other areas approved by the major department and the Dean of the School of Engineering, and 12 for a research-based

dissertation. In addition, a reading knowledge of two foreign languages which are relevant to the field of the dissertation is required (normally two of the following: French, German, or Russian). The Directors of Graduate Studies will, during the first period of full-time registration of each doctoral aspirant, appoint a Program Advisory Committee consisting of three members of the Graduate faculty in areas relevant to the student's intended major. The preliminary examination may be either written, oral, or a combination of written and oral components, at the discretion of the Committee.

Civil Engineering

Professor Brown, Chairman; Associate Professor Hill, Acting Chairman (121 Engineering); Professor Vesić, Director of Graduate Studies; Professors Abeles (visiting), Bryan, Meriam, Owen (visiting); Associate Professors Barton and Kumar; Assistant Professor Harrawood

A student may specialize in one of the following fields of study for either the M.S. or the Ph.D. degree with a major in Civil Engineering: engineering mechanics, hydraulic engineering, materials science, sanitary engineering, soil and foundation engineering, or structural engineering. Appropriate combinations of these fields are also encouraged. Each graduate student participates in seminars appropriate to his field of study.

Under the Reciprocal Agreement with the Consolidated University of North Carolina, a student may include as a portion of the minimum requirements work offered by the Department of Environmental Sciences and Engineering of the University of North Carolina. Although minor work normally is taken in the natural sciences or mathematics, a student whose major interest relates to the social sciences may take relevant minor work in this area.

A minimum prerequisite to the graduate program in civil engineering is a basic knowledge of mathematics through linear differential equations, materials science, solid mechanics, and fluid mechanics.

CE 201. Advanced Mechanics of Materials. Analysis of structural elements described by ordinary differential equations, such as beams on an elastic foundation, curved beams, beam-columns, circular plates; introduction to plates and shells; energy principles and their use in structural analysis. 3 units. Associate Professor Hill

CE 202. Experimental Stress Analysis. The experimental analysis of stress and strain in deformable bodies, correlation of theory with data from experiments; photoelasticity; strain gauges; dimensional analysis and similitude principles of models. 3 units. Associate Professor Hill

CE 205. Applied Elasticity. Introduction to linear theory of elasticity; solutions of two-dimensional problems; three-dimensional problems of torsion and bending; stress concentrations; energy and variational prin-

ciples with applications to design. 3 units. Professor Meriam and Associate Professor Hill

CE 211. Mechanical Behavior of Materials. Macroscopic mechanical properties of materials for static, fatigue, dynamic and creep conditions; impact, shock, and stress wave properties; temperature, creep, viscoelastic and relaxation properties. 3 units. Visiting Associate Professor Kumar

CE 212. Structural Materials. Elasticity and plasticity as related to rheology; natural and synthetic materials; reinforced materials; com-

posites. 3 units. Visiting Associate Professor Kumar

CE 221. Incompressible Fluid Flow. Steady and unsteady pipe flow, theories of turbulent flow; water hammer theory and control; surge tanks; air chambers; the analysis and control of fluid systems; effect of resistance; tapered conductors. 3 units. Assistant Professor Harrawood

CE 231. Structural Engineering. The application of the fundamental theories of structural action to the design and analysis of structural mem-

bers; specifications. 3 units. Professor Brown

CE 232. Reinforced Concrete Design. Design and analysis of reinforced concrete members including the influence of shrinkage and plastic flow; bond and diagonal tension; prestressed concrete members. 3 units. Professor Brown

CE 235. Foundation Engineering. An introduction to methods of analysis, design and construction of foundations. Bearing capacity and settlement of shallow and deep foundations. Soil exploration; excavation and bracing; drainage and stabilization; underpinning. Foundation vibrations. 3 units. Professor Vesic

CE 243, 244. Sanitary Engineering Unit Operations and Process Design. Fundamental bases for design of water and waste treatment systems, including transport, mixing, sedimentation and filtration, gas transfer, coagulation, and bio-treatment processes. 6 units. Professor Bryan

CE 250. Engineering Analysis. General concepts of the solutions of engineering problems with special emphasis on digital and analog computer and numerical methods; deflection and stability; torsion of non-circular beams and multicelled thin-walled structures; vibrations of beams and membranes; structures with both uniform and nonuniform properties and with rigid and nonrigid supports. 3 units.

CE 297, 298. Thesis Research. A student with proper background may carry on research under the direction of the staff in one of the following fields: engineering mechanics; foundation engineering; hydrolic engineering; materials science; structural engineering; or sanitary engineering. Masters' theses credit only. 6 units.

Members of the Graduate Staff

CE 302. Theory of Plates and Shells. Analysis of stresses and deformation of plates; vibrations of plates; membrane stress systems in shells; cylindrical shell analysis; bending stresses in shells. Prerequisite: CE 201, or CE 205, or equivalent. 3 units. Associate Professor Hill

CE 303. Introduction to Elastic Stability. This course is designed to

introduce the student to the concept of stability and its role in engineering applications. Specific topics to be covered include elastic columns with various end restraint; buckling of frameworks; rings and arches; lateral buckling of beams; buckling of thin plates and shells; utilization of energy theorems and calculus of variations; introduction to dynamic stability. 3 units. Associate Professors Barton and Hill

CE 321. Mechanics of Ideal Fluids. Basic equations of ideal fluid flow; potential and stream functions; vortex dynamics; body forces due to flow fluids; methods of singularities in two-dimensional flows; analytical determination of potential functions; conformal transformations; free-streamline flows. Prerequisite: Mathematics 285, 286 or equivalent. 3 units. Assistant Professor Harrawood

CE 322. Mechanics of Viscous Fluids. Equations of motion of a viscous fluid; general properties and selected solutions of the Navier-Stokes equations; boundary layer equations with selected approximate solutions; laminar boundary layers. Prerequisite: Mathematics 285, 286. 3 units. Assistant Professor Harrawood

CE 331, 332. Advanced Structural Design and Analysis. Analytical and behavior concepts of structural components as related to the design of structural systems; classical methods; numerical and approximate techniques; behavior of structural elements under static and dynamic loading; buckling behavior. Prerequisite: CE 231 or equivalent. 6 units. Associate Professor Barton

CE 335. Mechanical Behavior of Soils. Origin of soils, soil minerals and processes of soil formation; physical chemistry of multiphase systems and soil structure. Elements of soil stabilization; premeability and flow of water through soils: capillary and osmotic phenomena; seepage problems; soil compressibility; theory of consolidation; sheer strength and failure criteria. Stress-strain relationships, volume changes and pore pressures during shear, strength properties. Advanced laboratory soil testing techniques. 4 units. Professor Vesić

CE 336. Advanced Soil Mechanics. Theories of plastic and elastic equilibrium of soil masses and their application to analysis of problems such as: pressure on retaining walls, anchored bulkheads, cofferdams, silos, shafts, tunnels; stability of slopes and earth dams; stresses and settlement in soil masses and pavements, piles and pile groups subjected to lateral loads, elements of soil dynamics. Prerequisite: CE 335. 4 units. Professor Vesić

CE 365. Advanced Topics in Civil Engineering. Opportunity for study of advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 units. Members of the Graduate Staff

Electrical Engineering

Professor Wilson, Chairman (128 Engineering); Associate Professor Kerr, Director of Graduate Studies (108B Engineering); Professors Artley, Meier, Owen, and Vail; Associate Professors Burger (Adjunct), Kerr, Pilkington, and Wells; Assistant Professors George, Hacker, Joines, and Nolte; Lecturer Trickey

A student may specialize in any one of the following fields in working toward either the M.S. or the Ph.D. degree with a major in Electrical Engineering: solid-state materials and devices; ferromagnetics; superconducting circuits; instrumentation; electronics; microwaves; computers and automatic control; energy conversion; information processing; and biomedical engineering.

A minimum prerequisite to the graduate courses in electrical engineering is a basic knowledge of differential equations, electric and magnetic field theory, and the theory of networks. A previous course in

modern physics is recommended.

For Seniors and Graduates

EE 203. Random Signals and Noise. Introduction to mathematical methods of describing and analyzing random signals and noise. Review of basic probability theory; joint, conditional, and marginal distributions; random processes. Time and ensemble averages, correlation, and power spectra. Optimum linear smoothing and predicting filters. Introduction to optimum signal detection and parameter estimation, with applications such as radar. Selected laboratory work. 3 units. Professor Owen, Associate Professor Kerr

EE 204. Information Theory and Communication Systems. Information and entropy and their application in communication situations. Noise and channel capacity, coding, and the fundamental theorem of information theory. Continuous channels and transmission of band-limited signals. Comparisons of various practical modulation techniques from the standpoint of information rate and error probability. Prerequisite:

203. 3 units. Assistant Professor Nolte

EE 205. Signal Detection and Extraction Theory. Fundamentals of signal detection theory and its application to radar, sonar, and communication systems. Design of optimum detectors for known signals, for signals with unknown parameters, and for signals transmitted through fading channels. Analysis and comparison of optimum noise immunity of practical amplitude, pulse, and frequency modulation systems. Prerequisite: EE 203 or permission of instructor. 3 units. Assistant Professor Nolte

EE 206. Switching and Logic Networks. Techniques for the analysis and design of switching and logic networks. Number systems and Boolean algebra; codes; minimizing techniques; logic elements; logic

networks. Prerequisite: permission of instructor. 3 units. Assistant Professor George

ÉE 211. Solid State Theory. The fundamental theory of wave motion in solids. Wave mechanics; variational method; perturbation theory; many-electron problems; one-electron approximation; free-electron approximation; electron spin; Brillouin zones; time-dependent Schrödinger's equation; and transition probabilities. Introduction to thermostatics and statistical mechanics. Prerequisite: permission of instructor. 3 units. Associate Professor Pilkington and Assistant Professor Hacker

EE 212. Solid State Materials. Concepts of solid state physics as applied to engineering materials; electric, magnetic, thermal, and mechanical properties of solids; dielectrics; semiconductors; magnetic materials; and superconductors. Selected laboratory work. Prerequisite: EE 211.

3 units. Assistant Professor Hacker

EE 213. Principles of Magnetism. Classical field theory and quantum mechanical descriptions of magnetic properties of materials. Diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism, and ferrimagnetism. Resonance and relaxation in magnetic materials. Anistropy, magnetostriction, domain theory and switching properties. Selected topics to relate theory of magnetism to applications of engineering interest. Prerequisite: EE 211 or permission of instructor. 3 units. Assistant Professor Hacker

EE 215. Semiconductor Physics. A quantitative treatment of the physical processes that underlie semiconductor device operation. Topics include: Band theory and conduction phenomena equilibrium and non-equilibrium charge carrier densities; charge generation, injection, and recombination; drift and diffusion processes; low and high field conduction. Prerequisite: 211 or permission of instructor. 3 units. Assistant Professor Hacker

EE 217. Masers. Principles of masers, particularly optical masers. Discussion of quantum electronics, optical configuration; solid state, gaseous, and liquid devices; modulation; high power operation. Prerequisite: permission of instructor. Two class sessions and laboratory. 3 units.

Assistant Professor George

EE 222. Nonlinear Analysis. Introduction to methods of analyzing engineering systems described by nonlinear differential equations: analytic, numerical, graphical, and series approximation methods; analysis of singular points; stability of nonlinear systems. Applications of various methods, such as the modified Euler, Runge-Kutta, isoclines, perturbation, reversion, variation of parameters, residuals, harmonic balance, Bendixon, and Liapounov to phenomena of nonlinear resonance, subharmonics, relaxation oscillations, and forced oscillating systems. Prerequisite: permission of instructor. 3 units. Professor Wilson

EE 225. Semiconductor Electronic Circuits. Analysis and design of electronic circuits utilizing a variety of static and dynamic models of

semiconductor devices. Transistor and other semiconductor device circuit models; bias stability; high frequency and noise models switching characteristics; illustrative semiconductor circuits. Prerequiste: permission of instructor. Selected laboratory work. 3 units. *Professor Owen, Assistant Professor Joines*

EE 227. Network Synthesis. Linear network theory, including a review of time and frequency domain analysis; network graphs; network functions and realizability condition; driving point impedance synthesis of passive networks; driving point and transfer specifications; approximation methods. Prerequisite: permission of instructor. 3 units. Professor

Vail, Assistant Professor George

EE 241. Linear Control Systems. Theoretical and applied principles of design of linear, continuous-data control systems. Integration of system elements into a closed loop system. Stability from Routh, Nyquist and root locus viewpoints. Time and frequency domain methods. Performance improvement using compensation. Disturbances and multiple inputs. Two class sessions and one three-hour laboratory. Prerequisite: permission of instructor. Credit not given for both EE 199 and EE 241. 3 units. Associate Professor Wells

EE 244. Selected Topics in Control Systems. Analysis and design of linear sampled-data systems using Z-transform and modified Nyquist approaches. Analysis of linear systems with statistical inputs and nonlinear systems using describing functions. Analog and digital computer techniques for the solution of appropriate problems. Prerequisite: EE 203 and either EE 199 or EE 241. 3 units. Associate Professor Wells

EE 259. Advanced Electric Energy Conversion. Equations of motion of electromechanical systems; fields and lumped parameters, state function concepts; mathematical techniques for analyzing electromechanical devices and systems; transducers; unified treatment employing matrix, tensor, and block-diagram concepts to obtain response under static and dynamic conditions: the generalized rotating machine. Prerequisite: permission of instructor. 3 units. Mr. Trickey

EE 265. Advanced Topics in Electrical Engineering. Opportunity for study of advanced subjects related to programs within the electrical engineering department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of

instructor under whom work will be done. 1 to 3 units. Staff

EE 271. Electromagnetic Theory. The classical theory of Maxwells equations; electrostatics, magnetostatics, boundary value problems including numerical solutions, currents and their interactions, force and energy relations. Three class sessions. Prerequisite: permission of instructor. 3 units. Assistant Professor Joines

EE 272. Applications of Electromagnetic Theory. Propagation of electromagnetic waves in various structures and media; mathematical

description of microwave networks, including equivalent circuits and matrix methods; microwave circuit theorems and synthesis techniques. Selected laboratory experiments. Prerequisite: EE 271. 3 units. Assistant Professor Joines

For Graduates

EE 304. Advanced Statistical Analysis and System Design. Advanced statistical techniques useful for analysis and design in both communication and control systems. Introduction to statistical decision theory, and design to minimize average risk. The Bayesian approach to parameter estimation, smoothing, prediction, and signal detection. Wiener-Kalman filters and their application to signal processing in control situations. Prerequisite: EE 203. 3 units. Associate Professor Kerr

EE 311. Quantum Theory of Materials. Concepts of the quantum theory of solids as applied to engineering materials. Topics selected will vary with the interests of the class, but the importance of quantized fields in crystals (phonons, magnons, plasnons, excitons, and polarons) and the interaction of these fields will be stressed. Prerequisites: EE 211

and Physics 316. 3 units. Associate Professor Pilkington

EE 313. Magnetic Processes in Materials. Selected topics in magnetism. Cryomagnetics, spin wave resonance, interaction of superconductor and ferromagnetic materials, nonlinear spin wave theory, ferrimagnetic exchange, double exchange, superexchange, effects of finite dimensions and interfaces on basic properties of ferromagnets. Microwave applications. Prerequisite: EE 213, or permission of instructor. 3 units. Professor Artley

EE 315. Semiconductor Devices. Derivation of the d-c and incremental electrical characteristics of p-n junction and junction transistors; equivalent circuit models: parameter determination; implication and limitations of models for describing device operation; thermal runaway; avalanche device operation; thin film, multi-junction and other modern devices. Prerequisite: EE 215. 3 units. Assistant Professor Hacker

EE 321. Nonlinear Magnetic and Semiconductor Circuits. Mathematical description on nonlinear magnetic and semiconductor characteristics; transient and steady-state analysis and synthesis of nonlinear systems with application to such topics as magnetic amplifiers, frequency converters, oscillators, computer logic, switching devices, and inverters. Pre-

requisite: permission of instructor. 3 units. Professor Wilson EE 324. Nonlinear Oscillations in Physical Systems. Analysis of phenomena encountered in free and forced oscillating systems: stability criteria, topological methods, degenerate systems and discontinuous theories, relaxation oscillations, asymptotic approaches. Emphasis on interdependence of physical and mathematical reasoning in analyzing nonlinear electrical and mechanical systems. Illustrative examples selected to meet interest of class. Prerequisite: EE 222. 3 units. Pro-

fessor Wilson

EE 342. Introduction to Optimal Control Theory. The state space formulation for both continuous and discrete linear systems. The theory of optimal control, as approached by the methods of calculus of variations, Pontryagin, and dynamic programming. Examples of two point boundary value problems, and minimization of quadradic functionals. Permission of instructor. 3 units. Associate Professor Kerr

EE 361, 362. Electrical Engineering Seminar-Journal. A weekly seminar in which graduate students and the faculty of Electrical Engineering meet to discuss research and professional activities. Presentations and discussions by faculty, students and persons visiting the campus are directed toward increased understanding of scientific and professional activities at local, regional, national and international levels. Selected articles from scientific and professional journals are reviewed by students with the objective of providing a continued overview of relevant and significant publications in the current literature. Although this course carries no graduate credit, it is expected that each graduate student will participate in the seminar for at least two semesters while in residence at Duke University. Professor Artley

EE 371. Advanced Electromagnetic Theory. An advanced treatment of topics in electromagnetic theory selected from the interests of the instructor and students. Representative topics are propagation in anisotropic media, plasma waves, antennas, and boundary value prob-

lems. Prerequisite: EE 272. 3 units. Professor Artley

EE 373. Selected Topics in Field Theory. An advanced treatment of topics in generalized field theory selected from the interests of the instructor and the students. Representative topics are generalized fields, electromagnetic interactions, quantum electrodynamics, inhomogeneous media, and diffusion phenomena. Prerequisite: EE 272. 3 units. Professor Artley

EE 375. Interaction of Electron Beams and Waves. Treatment of space-charge waves, slow-wave structures, and electron beams in various configurations such as traveling wave tubes, klystrons, and magnetrons; application of coupled-mode theory. Prerequisite: EE 272. Selected

laboratory work. 3 units. Assistant Professor George

EE 399. Special Readings in Electrical Engineering. Special individual readings in a specified area of study in electrical engineering. Prerequisite: approval of the Director of Graduate Studies. 1-3 units. Members of the Graduate Staff

Mechanical Engineering

Professor Chaddock, Chairman and Director of Graduate Studies (142A Engineering); Professors Kenyon, Linderoth, Macduff, Meriam and

Pearsall; Associate Professors Elsevier and Harman; Assistant Professor Buzzard.

Graduate Study is available to students seeking the M.S. degree with a major in mechanical engineering. Emphasis is placed on advanced study, research and design in three primary areas: thermal and fluid systems, design and control of machines and processes, and the development of materials. In the early stages of development are two new interdisciplinary areas, namely biomedical engineering and oceanographic engineering. The program includes opportunities for advanced experimental work as well as theoretical study. Special emphasis is offered in the particular areas of heat and mass transfer, thermodynamics, highspeed transportation, hydrodynamics, compressible flow, vibrations, system response and control, refrigeration and cryogenics, nuclear engineering, mechanical design and the science of materials. Increasing emphasis is placed on developing the creative abilities of graduate students and on relating the work to the evolving needs of modern engineering practice.

ME 201. Introduction to Advanced Mechanics. A comprehensive introduction to advanced theory and application in advanced mechanics with emphasis on stability, space kinematics and kinetics of particles and rigid bodies, generalized motion equations for constant and timedependent mass systems, and generalized coordinates. 3 units.

sor Meriam

ME 202. Theoretical Thermodynamics. Classical thermodynamics and thermodynamic continuum properties for real substances; equilibrium; introduction to statistical thermodynamics. 3 units. Associate Professor Harman

ME 221. Compressible Fluid Flow. The concepts and analysis for flow of gases in subsonic to hypersonic regimes. Two-dimensional flow; oblique shocks; experimental techniques. 3 units. Associate Professor

Harman and Assistant Professor Buzzard

ME 222. Heat Transfer. Steady state and transient solutions of the general heat conduction equation. Development of the equations for transport of energy by fluid motion. Principle of similarity and dimensional analysis in convective energy transport. The boundary layer equations; the laws of radiation transfer; radiation heat exchange. 3

Professors Chaddock and Kenyon

ME 231. Systems Engineering. Methods applicable to design for obtaining parameters for strength, response and stability studies of mechanical systems. Analysis of closed loop control systems with linear transfer functions; electrical and mechanical analogs; introduction to determination of transfer function from input-output characteristics. 3 units. Professor Macduff

ME 232. Systems Engineering. Effect on design of inherent system nonlinearities; eigenvalues and eigenvectors of simple systems with nonlinear springs; nonlinear damping; methods of linearization. Frequency response of nonlinear systems by approximate methods; transient and frequency response of nonlinear systems by numerical integration and

transfer matrices. 3 units. Professor Macduff

ME 265. Advanced Topics in Mechanical Engineering. Opportunity for study of advanced subjects related to major and minor programs in mechanical engineering. During the past two years, advanced topics have been: air conditioning, boundary layer theory, atomic bonding, polymer science, and stress analysis. Prerequisites: Approval of the Director of Graduate Studies and the instructor under whom the work will be done. 1 to 3 units. Members of the Graduate Staff

ME 280. Nuclear Reactor Power Cycles. Basic reactor principles and types. Examination of most feasible thermodynamic cycles for use with both stationary and mobile power plants. Consideration of safety shielding, heat transfer, fluid flow and materials problems unique to reactor

design. 3 units. Professor Kenyon

English

Professor Stevenson, Chairman (323 Allen Building); Professor Nygard, Director of Graduate Studies (321 Allen Building); Professors Boyce, Acting Director of Graduate Studies, Budd, Duffey, Visiting Professor Eliason, Gohdes, Heninger, Lievsay, Patton, Reiss, Sanders, Smith, Turner, Van Kluyve, and Ward; Associate Professors Ferguson, Randall, and Williams

The department offers graduate work leading to the A.M., M.A.T., and Ph.D. degrees. A statement of the requirements for the Ph.D. degree may be obtained from the Director of Graduate Studies.

For Seniors and Graduates

203. Chaucer. Reading and interpretation of the minor poems, Troilus, and The Canterbury Tales. 3 units. Professors Nygard and Reiss

207. Old English Grammar and Readings. 3 units. Professors Nygard and Reiss

208. History of the English Language. A survey of the language from Old to Present-day English, taking into consideration developments in phonology, morphology, syntax, and vocabulary. 3 units. Professors Nygard and Reiss

209. Present-Day English. A description of present-day American English from the point of view of modern linguistic theory; comparison of traditional and structural grammars; semantic change; the relation of the written to the spoken language; usage. 3 units. Professors Nygard and Reiss

213. Introduction to Folklore. A survey of the materials of popular

tradition, the folksong, the folktale, the proverb, the riddle, and other forms; the methods of folklore investigation; and the relation of these popular genres to literary tradition. 3 units. (Not 1967-68) *Professor*

Nygard

215, 216. Tudor and Stuart Drama, 1500-1642. The first semester includes Peele, Lyly, Greene, Kyd, Dekker, Heywood, Chapman, and Marston, with emphasis on Marlowe. The second semester, which emphasizes Jonson, is devoted also to Webster, Beaumont, Fletcher, Massinger, Middleton, Ford, and Shirley.

217. Milton. Milton's poetry and prose, with emphasis on the major

poems. 3 units. Professor Lievsay

218. Spenser. A study of his works. 3 units. Associate Professor

Heninger

219, 220. The Eighteenth Century. Swift, Pope, Defoe, Addison, Steele, and others are studied in the first semester; in the second, Gray, Johnson, Boswell, Collins, Goldsmith, the novelists, and other writers. 6 units. Professor Boyce, Associate Professor Ferguson

221, 222. English Literature of the Early Nineteenth Century. Wordsworth, Coleridge, Scott, Byron, Shelley, Keats, Lamb, Hazlitt, and other

writers. 6 units. Professors Patton, Sanders, and Stevenson

223, 224. English Literature of the Later Nineteenth Century. The first semester is devoted chiefly to Carlyle, Dickens, Thackeray, Tennyson and Browning; the second semester to Arnold, Ruskin, Pater, George Eliot, Meredith, the Pre-Raphaelites, and Swinburne. 6 units. Professors Sanders, Stevenson

227. Literary Criticism. A study of the Greek and Roman critics, in chronological order but with emphasis on their permanent value rather than on the mere history; also of the Continental and English critics to about 1700. 3 units. (Not 1967-68) Professor Lievsay

229, 230. American Literature, 1800-1865. The writers emphasized in the first semester are Emerson, Thoreau, and Hawthorne; in the second semester, Poe and Melville. 6 units. Professors Turner and Budd

233, 234. American Literature, 1865-1920. Selected works of representative authors of the period. The first semester will include Whitman, Lanier, Mark Twain, James, Howells, Emily Dickinson, Henry Adams, and the Local Colorists; the second semester, Crane, Norris, Moody, London, Dreiser, Edith Wharton, Willa Cather, O'Neill, Robinson, and Frost. The lectures will deal primarily with literary trends as shaped by the social background. 6 units. *Professor Gohdes*

235, 236. American Literature Since 1920. First semester, selected fiction from Gertrude Stein to the present. Second semester, poetry from the Imagist movement to the present. 6 units. Professor Duffey

237. English Drama, 1642-1800. The heroic play and the comedy of manners of the Restoration; the important plays, serious and comic, of the eighteenth century. 3 units. Professor Ward (Not 1967-68)

239. Shakespeare. The plays and poems. 3 units. Professor Hen-

inger, Associate Professor Williams

244. Literary Biography. Reading and discussion of works by Plutarch, Roper, Walton, Aubrey, Mason, Johnson, Boswell, Lockhart, Carlyle, Froude, Gosse, and Strachey: the development of the literary form, its various methods, various theories of its nature and purpose. 3 units. Professor Sanders

251, 252. English Literature of the Seventeenth Century. Major works in prose and poetry from 1600 to the death of Dryden. 6 units. Professor

Ward, Associate Professor Randall

261, 262. English Literature of the Twentieth Century. Representative work of leading writers from 1900 to 1950, in fiction, drama, and poetry. The first semester will include Shaw, Conrad, Yeats, Wells, Bennett, Galsworthy, Ford, Synge, Forster, and Lawrence; the second semester, Joyce, Woolf, Edith Sitwell, Eliot, Huxley, Graves, Bowen, Auden, and Dylan Thomas. Critical analysis of selected texts, with discussion of techniques and ideas. 6 units. Professor Smith

264. Major Developments in Contemporary American Poetry. The principal contributions to modern poetry made by American poets, including imagism and the new poetry; Eliot, Stevens, Crane, the "Fugitives," and a selection from the poets of the present generation. 3 units.

(Not 1967-68)

266. Recent Critical Thought. Questions of the nature and value of literature as reflected in recent criticism, theoretical and practical. 3 units.

Professor Duffey

269, 270. Southern Literature. The principal authors and the chief literary development from the beginning to the present. Emphasis in the first semester is on Byrd, Kennedy, Simms, Poe, Timrod, and the humorists; in the second on Lanier, Harris, Cable, Mark Twain, Ellen Glasgow, and Faulkner. Attention is given to the historical and cultural background and to literary relations extending outside the region. 6 units. Professor Turner

277. English Prose of the Sixteenth Century. Readings in the major

forms and authors. 3 units. Professor Lievsay (Not 1967-68)

278. English Non-Dramatic Poetry of the Sixteenth Century. Extensive select readings from representative types and authors, excluding Spenser. 3 units. Professors Lievsay and Heninger

For Graduates

304. Studies in the Metaphysical Poets. A careful study of Donne, Herbert, and Vaughan against the seventeenth-century background, with some attention to their influence on other writers in the period and their impact on twentieth-century poetry. 3 units. Professor Lievsay

306. Studies in Chaucer. Cultural background, sources, themes, struc-

tures; special attention to *Troilus* and the dream-vision poems. 3 units. *Professor Nygard*

311. Beowulf. Reading and interpretation of the text. 3 units. Pro-

fessor Nygard

313. The Traditional Ballad and Folksong. Studies in English, Scottish, and American popular poetry, with attention to the textual and musical traditions. (No technical knowledge of music is required.) 3 units. Professor Nygard

315. Middle English Literature. The literature of England from 1100 to 1500 (excluding Chaucer); a study of medieval genres with a close reading of selected major works. 3 units. Professor Nygard (Not 1967-

68)

320. Medieval Romances. Origins, types, forms, themes; special at-

tention to Arthurian materials. 3 units. (Not 1967-68)

322. Genre Studies in Twentieth-Century American Literature. Formal and thematic problems posed by the fiction, poetry or drama of this

century. 3 units. Professors Duffey and Gohdes

330. Textual Criticism. The principles of analytical bibliography and their application to problems and procedures in the study of Elizabethan printed books. 3 units. (Not 1967-68) Associate Professor Williams

331. Emerson. A study of Emerson's ideas as reflected in selected

examples of his essays and poems. 3 units. Professor Gohdes

332. Whitman. A detailed study of Leaves of Grass and of selected

prose works. 3 units. (Not 1967-68) Professor Gohdes

333. Hawthorne and Melville. Extensive reading in the works of Hawthorne and Melville, and close study of selected writings. 3 units. Professor Turner

334. Studies in the Critical and Philosophical Ideas of Coleridge and

Carlyle. 3 units. Professor Sanders

338. Studies in American Realistic Fiction. Intensive study of a post-Civil War novelist such as Howells, with lesser attention to a representative precursor such as De Forest, and a twentieth century writer such as Dreiser. 3 units. (Not 1967-68) Professor Budd

339. Studies in Shakespeare. Intensive study of carefully limited topics, together with critical analysis and interpretation of selected texts. 3 units.

Professor Heninger, Associate Professor Williams

340. Studies in Renaissance English Prose. Close readings in various forms and authors as they reflect the culture and thought of the Renais-

sance. 3 units. (Not 1967-68) Professor Lievsay

342. Studies in Dryden and His Age. The early poems, the important odes, the religious and political poems, selected critical and controversial prose, the heroic play and tragedy. 3 units. (Not 1967-68) Professor Ward

345. The Eighteenth-Century Novel. Richardson, Fielding, Smollett,

and Sterne are emphasized. Attention is given to earlier prose fiction and to other contributing literary patterns. 3 units. *Professor Boyce*

346. Studies in Swift. Intensive study of the major prose; selected readings in the verse, political writings, and miscellaneous prose. 3 units. (Not 1967-68) Associate Professor Ferguson

347. Studies in Victorian Poetry. Analysis of themes, forms, and sources in the works of Tennyson, Browning, Arnold, Rossetti, Swinburne, Meredith, Hardy, and Hopkins. 3 units. (Not 1967-68) Professor Stevenson

348. Studies in Victorian Fiction. Techniques and principal types of material in the novels of Dickens, Thackeray, Trollope, Eliot, Meredith, and Hardy. 3 units. (Not 1967-68) Professor Stevenson

363. Studies in British Poetry of the Twentieth Century. Detailed examination of major poetic texts, with background readings in prose. 3

units. Professor Smith

374. Studies in American Humor. The native tradition in the Down-East humorists and the humorists of the Old Southwest, in Mark Twain and his contemporaries, and afterward. 3 units. Professor Turner

378. Samuel Johnson's Literary Criticism and Related Topics. 3 units.

Professor Boyce

English for Foreign Students. A non-credit semester course in English for foreign students. Restricted to registered undergraduate and graduate foreign students and, to capacity, to employees and wives of foreign students. Without fee for registered students who are permitted an audit without fee; otherwise a \$5.00 fee.

Forestry

Professor Harrar, Chairman (213 Biological Sciences Building); Professor Yoho, Director of Graduate Studies (104 Biological Sciences Building); Professors Anderson, Barnes, Fluke, Johnson, Kramer, Naylor, Osborne, and Ralston; Associate Professors Knoerr, Stambaugh, Sullivan, and Woods; Assistant Professor Braaten

Major and minor work is offered in the natural and social scientific aspects of forestry leading to the Master of Arts and Doctor of Philosophy degrees. Work for these degrees may be pursued in forest-tree physiology, wood anatomy and properties, forest pathology, silvics, forest soils, forest mensuration and biometry, forest entomology, forest economics, and forest climatology and hydrology. College graduates who have had specialized training in professional forestry or the related basic areas of the natural or social sciences may be considered for admission. Students without previous forestry training are ordinarily restricted to the particular fields (listed above) for which their academic background qualifies them. For information on professional training in forestry see Bulletin of the School of Forestry.

For Seniors and Graduates

203. Forest Meteorology. The science of meteorology, including microclimatology, as it is related to forest biology and hydrology; emphasis is on physical laws governing exchange of heat and moisture in the climatic environment. Prerequisite: One year of college physics; calculus desirable. 3 units. Associate Professor Knoerr

223. Forest Pathology. Infectious and non-infectious diseases of forest trees, and related deterioration of forest products. Field and laboratory study of symptoms, etiology, and control. Prerequisites: Botany 1 and 2,

or equivalent. 3 units. Associate Professor Stambaugh

230. Forest Entomology. Principles of protecting forests from injurious insect infestations; characteristics and identification of insect-caused damage to trees and wood products; identification, biology, and control of the more important tree-infesting insect species. 3 units. Professor Anderson

- 243. Silvics. Ecological foundations of silviculture with special reference to forest site factors; influence of forests on their environment; growth and development of trees and stands; origin, development, and classification of forest communities; methods of studying forest environments. Desirable prerequisite: plant physiology, plant ecology, and Forestry 261, or equivalent. 3 units. (Summer only.) Associate Professor Woods
- 251. Sampling Methods in Forestry. Statistical background for solution of sampling problems with special references to sampling of forest and associated populations. Prerequisite: Forestry 151. 3 units.* Professor Osborne
- 257. Design of Forestry Experiments and Analysis of Data. Role of experimental design in field and laboratory, and statistical analysis of data as aspects of scientific method in forest research. 3 units. * Assistant Professor Braaten
- 261. Forest Soils. Origin, development, and classification of soils with special emphasis on those developed in humid climates; morphological, physical, and chemical properties of soils in relation to growth of trees; effect of forests on soils. Prerequisites: Chemistry 1 and 2, and Physics 1, or equivalents; physical geology, mineralogy, petrology, and analytical

chemistry are also desirable. 3 units. Professor Ralston

270. Economics of Forestry. Development of the principles of economics useful in the analysis of the past, present, and prospective supply and demand situations for forestry goods and services; problems of the economics of the firm and industry, basic and peculiar to forestry, with special attention to the time dimensions of value; the role of forestry in the general economy including attention to relevant institutional factors. Prerequisite: at least one course in the principles of economics. 3 units. Professor Yoho

276. Forestry Policy. Objective study and analysis of the development

of public land and forestry policies in the United States, present policies of public and private forestry organizations, and current policy issues in the light of economic and other criteria. 2 units. *Professor Yoho*

290. Wood Anatomy. Study of the physical features and the gross and minute structural characteristics of wood leading to the identification of the commercial woods of the United States, and the important tropical woods used in American wood-working industries. Elementary microtechnique. Prerequisites: one year of biology, Forestry 241 or equivalent. 3 units. Associate Professor Sullivan

295. Surface Generation in Wood. Directed energy systems; physics of edges; details of wood surface generation machinery; surface generation in relation to wood anatomy; physical measurement of wood surfaces. Prerequisites: For. 290 or equivalent, calculus. 2 units. Associate Pro-

fessor Sullivan

296. Chemistry of Wood. Nuclear, atomic and molecular force systems; chemical composition and distribution of chemical components in wood; interaction of wood and moisture; macro-chemical reactions of wood and other cellulosic systems including degradation reactions. Prerequisites: Forestry 290 or equivalent, calculus, organic chemistry. 3 units. Associate Professor Sullivan

297. Wood Physics (Mechanics). A study of the reaction of wood to mechanical forces; the derivation of working properties and their variance; experimental and standard testing procedures; introduction to theories of elasticity and plasticity; theories of failure; anatomical and moisture effects. Prerequisites: Forestry 290 or equivalent, calculus, col-

lege physics, statistics. 3 units. Associate Professor Sullivan

For Graduates

301, 302. Advanced Studies in Forestry. To meet individual needs of graduate students in the following branches of forestry: (a) Silvics, (b) Forest Soils, (e) Forest Economics, (f) Properties of Wood, (g) Forest Mensuration and Biometry, (h) Forest Entomology, (k) Forest-tree Physiology, (l) Forest Pathology, (m) Forest Climatology and Hydrology. As designated under 357, 358

321. Research Techniques in Forest Pathology. Fundamental phytopathological methods employed in field and laboratory investigations of tree disease pathogens. Literature review and discussion of current developments. Prerequisite: Forestry 223 or equivalent. 3 units. As-

sociate Professor Stambaugh

331. Toxicology of Insecticides. Study of the physical, chemical, and biological properties of materials used to destroy insects. Formulation, toxicology and insect physiology as related to insecticide action are emphasized. Prerequisites: one course in entomology; organic chemistry is recommended. 3 units. Professor Anderson

332. Ecology of Forest Insects. Study of the environmental factors as

they influence insect population development. Both the physical and the biotic aspects are considered on the basis of field and laboratory experimental methods. Prerequisite: Forestry 230 or equivalent. 3 units. fessor Anderson

333. Morphology and Taxonomy of Forest Insects. Principles of insect structure, classification and nomenclature; laboratory work concentrated on the collection, preservation and identification of both the adult and immature stages of various forest insects. Prerequisite: Forestry 230 or Professor Anderson equivalent. 3 units.

342. Forest Hydrology. The influence of forests and other vegetation on local climate, the hydrolic cycle, and soil stability; relationships to water yield, floods, and erosion. Prerequisite: One year of college physics;

calculus desirable. 3 units. Associate Professor Knoerr

344. Micrometeorology. Physics of the earth's surface environment with emphasis on plant and animal microclimates: budgets of mass, momentum and energy; vertical structure of wind, temperature, water vapor and carbon-dioxide in relation to exchange processes within the biosphere; local circulation and eddy diffusion; principles of micrometeorological measurement. Prerequisite: Forestry 341, calculus desirable. 3 units. Associate Professor Knoerr

347, 348. Seminar in Silvics. Advanced topics in silvics are discussed and current research papers and reports are reviewed, analyzed, and

evaluated. 2 units. Associate Professor Woods

352. Analysis of Forest Measurements. Empirical equations and curvefitting appropriate to forestry data; functional relationships among experimental responses; useful mathematical models for forestry populations; selected non-parametric analysis methods. Prerequisite: Forestry 250 or Mathematics 233 or equivalent. 3 units. Assistant Professor Braaten

353. Sampling and Experimental Design in Forestry. Theory and application of selected sampling designs to forestry populations. Includes multistage and multi-phase designs; acceptance and sequential sampling; regression, ratio, and double sampling; sampling with variable probability of selection. Construction and analysis of designs for forestry experiments. Prerequisites: Forestry 250 or mathematics 233 or equivalents. 3 Professor Osborne

357, 358. Research in Forestry. Credits to be arranged. Students who have had adequate training may do research under direction of members

of the faculty in the following branches of forestry.

1. Silvics. Prerequisites: Forestry 241, 243, and 244, or equivalents.

Associate Professor Woods

2. Forest Soils. Prerequisite: Forestry 261 or equivalent.

5. Forest Economics. Prerequisite: Forestry 270 or equivalent. Professor Yoho

6. Properties of Wood. Prerequisites: Forestry 259 and 260, or equiv-

alents. Professor Harrar and Associate Professor Sullivan

7. Forest Mensuration and Biometry. Prerequisites: Forestry 151, 251, and 252, or equivalents. Professor Osborne and Assistant Professor Braaten

8. Forest Entomology. Prerequisite: Forestry 230 or equivalent.

Professor Anderson

11. Physiology of Forest Trees. Prerequisites: Plant physiology and plant ecology or silvics. Professor Kramer

12. Forest Pathology. Prerequisites: Plant physiology and Forestry 223

or equivalent. Associate Professor Stambaugh

13. Forest Climatology and Hydrology. Prerequisite: Forestry 341, 342, or equivalents. Associate Professor Knoerr

14. Forest Biochemistry. Prerequisites: Plant physiology, organic

chemistry. Professor Barnes

362. Forest Soil Physics. Analysis of the physical properties of soil related to the growth and development of forest trees. Consideration is given to the significance of soil moisture, temperature, aeration, and structural characteristics in the analysis of forest growth relationships. Prerequisite: Forestry 261. 3 units. (1967-68) Professor Ralston

366. Forest Soil Fertility. The relationships of soil fertility factors in the growth of forest trees. Emphasis is placed on the analysis of soil factors related to the mineral nutrition of trees. Prerequisites: Forestry 262 with analytical chemistry recommended. 3 units. (Not 1967-68)

Professor Ralston

368. Field Seminars. Field studies, consultations, and visits to areas of interest during spring vacation period, or at other times, in the several branches of forestry listed under Forestry 301-302. Credits to be arranged.

As designated under 357, 358

378. Seminar in Forest Economics. Examination and discussion of the application of economic concepts in forestry, the potential contribution of economic analysis to private and public forest management; current research in forest economics. Prerequisites: Forestry 270 and 379 or consent of the instructor; advanced courses in economics and economic

theory are desirable. 2 units. Professor Yoho

379. Economic Analysis in Forestry. Principles of economics of particular value to problems of resource allocation and efficiency in private forest management based on a static and dynamic firm theory approach, linear programming and activity analysis. Development of production principles applicable to forestry problems in use of land, labor, and capital; resource and production combinations; production location and timing; cost structure and asset control; uncertainty and expectations. Prerequisites: Forestry 270 or consent of instructor. 3 units. Professor Yoho

390. Wood-Liquid Surface Interactions. Free surface energy of liquids

and solids; theory of adhesion; adhesion for wood substrates; physical and chemical description of adhesives and adhesive joints; wood coatings; physical and chemical properties of surface coating materials. Prerequisites: Forestry 296. 3 units. Associate Professor Sullivan

391. Seminar in Wood Science and Forest Products. Application of scientific disciplines to product research and development; wood science in industry. 1 unit. Professor Harrar, Associate Professor Sullivan

392. Advanced Wood Physics. Theories of elasticity and plasticity; mechanical damping; piezoelectric properties; structure of crystals; fatigue failure. Prerequisites: Forestry 297, Forestry 296, Experimental Design. 3 units. Associate Professor Sullivan

Geology

Associate Professor Heron, Acting Chairman and Director of Graduate Studies (105 Science Building); Assistant Professors Pilkey, Lynts

The Department of Geology offers graduate work leading to the A.M. degree. An undergraduate degree in geology is not a prerequisite for graduate studies, but a student must have had or must take introductory courses in field geology, mineralogy, sedimentary rocks, stratigraphy, paleontology, and structural geology. In addition he must have had one year of college chemistry, one year of college physics, and mathematics through calculus.

Graduate courses in the Department of Geology are designed to provide training in the field of environmental sedimentary geology with specialized training in bio-environments, litho-environments, or modern environ-

ments.

An acceptable thesis is required.

For Seniors and Graduates

203. Advanced Stratigraphy. A survey of the Phanerozoic deposits of the world with special emphasis on type areas. Prerequisites: Geology

143 or consent of instructor. Given biennially. 3 units.

205. Geological Oceanography. The study of the broad geologic aspects of the ocean basins, including origin, bottom physiography, sediment distribution and sedimentary processes. Observations in the field will be emphasized and will include training in sampling procedures for both shallow and deep water. This course is not open to students who have completed Geology 206. 6 units. Assistant Professor Pilkey (Given at Beaufort only.)

206. Principles of Geological Oceanography. A broad survey of many geological aspects of the oceans including sediment types, processes of sedimentation, geological structures of the ocean basins, and bottom

physiography. Prerequisites: Geology 207 or consent of instructor. 3 units. Assistant Professor Pilkey

207. Sedimentary Petrography. Systematic description and classification of sedimentary rocks. Prerequisites: Geology 108 or consent of instructor. 3 units. Associate Professor Heron

222. Sedimentary Minerals. Major detrital and authigenic minerals with emphasis on the clay minerals. Prerequisites: Geology 102 or

consent of instructor. 3 units. Associate Professor Heron

235. Sedimentary Geochemistry. A survey course of the broader aspects of marine geochemistry and the geochemistry of ancient and recent sediments. Also included is a review and general summary of inorganic chemical principles important in the control of geochemical processes. Prerequisites: Geology 102 or consent of instructor. 3 units. Assistant Professor Pilkey

241-242. Invertebrate Paleontology. Biologic and stratigraphic relationships of fossil invertebrates, with special emphasis on evolutionary trends of invertebrates as interpreted from fossil evidence. Prerequisites: Geology 51, 52, or consent of instructor. Given biennially. 6 units.

sistant Professor Lynts

243-244. Micropaleontology. Microscopic animal and plant fossils, exclusive of spores and pollen, with special emphasis on their biology, taxonomy, evolution and stratigraphic distribution. Prerequisites: Geology 242, or consent of instructor. Given biennially. 6 units. Professor Lynts

247. Paleoecology. Application of ecologic and geologic principles to the reconstruction of the interrelationship between organisms and their environment in geologic time. Prerequisites: Geology 207, 242, or consent of instructor. 3 units. Given biennially. Assistant Professor Lynts

251. Geomathematics. Application of quantitative techniques, including geometrics, to the characterization and solution of geologic problems. Prerequisites: Geology 51, 52, Mathematics 22, or consent of instructor. 3 units. Given biennially. Assistant Professor Lynts.

For Graduates

305. Physical Environments Seminar. 3 units. Assistant Professor Pilkey

306. Bio-Environments Seminar. 3 units.*

340. Paleontology Seminar. Prerequisites: consent of instructor. 1

Assistant Professor Lynts

371, 372. Advanced Topics in Geology. To meet the individual needs of graduate students for independent study in the various environmental sedimentary fields. 1 to 3 units. All Members of the Graduate Staff

Related Courses in Other Departments

Courses comprising a candidate's minor may be selected from the fields of zoology, physics, mathematics, chemistry, or approved courses offered in the Department of Geology at the University of North Carolina at Chapel Hill.

Germanic Languages and Literature

Professor Salinger, Chairman and Director of Graduate Studies (106 Foreign Languages); and Professor Phelps; Associate Professor Seymour; Assistant Professors Best and Salamon; Visiting Lecturer Arnoldner

The Department of Germanic Languages and Literature offers graduate work leading to the A.M. degree. Students who expect to major in German should have had sufficient undergraduate courses in Germanic languages to enable them to proceed to more advanced work.

Students who wish to take courses in German for a minor should normally have completed a third-year course (in exceptional cases, a

second-year) of college German with acceptable grades.

For Seniors and Graduates

201, 202. Goethe. A study of his life and works, in the light of his lasting significance to Germany and world literature. 6 units. *Professors Salinger and Phelps*

203, 204. Eighteenth Century. Eighteenth-century German literature in its relation to contemporary European philosophy. 6 units. (Not 1967-

68) Professor Phelps

205, 206. Middle High German. The language and literature of Germany's first classical period. 6 units. ** Associate Professor Seymour, Visiting Lecturer Arnoldner

207, 208. German Romanticism. The course covers the entire field of German Romanticism from 1800 to 1850. 6 units.* Visiting Lecturer

Arnoldner

209, 210. Kleist, Grillparzer, and Hebbel. The development of the drama in Germany and Austria between Schiller and naturalism. 6 units.* Professor Salinger

211, 212. Heinrich Heine. A study of the German poet and his immediate successors in the movement known as Jungdeutschland. 6 units.*

Professor Salinger

213. Nineteenth-Century Literature. From the end of Romanticism through Realism. Readings from Mörike, Büchner, Hebbel, Stifter, Keller, Meyer, Storm, and Fontane. 3 units.

214. The Twentieth Century. Literature from the turn of the century

to the present, as seen through representative authors. 3 units. (1967-

68) Assistant Professor Salamon

215. Seventeenth-Century Literature. A study of the leading writers of the Baroque, seen against the background of their time. 3 units. (Not 1967-68)

216. History of the German Language. The development of the phonology, morphology, and syntax of German from earliest beginnings to the

present. 3 units. (1967-68) Associate Professor Seymour

217. Renaissance and Reformation Literature. The period from 1400 to

about 1600. 3 units. (1967-68) Assistant Professor Best

218. The Teaching of German. Critical survey of modern teaching techniques; intensive practice in solving problems encountered in the teaching of German on the secondary and college levels. Analysis and evaluation of textbooks and related audio-visual materials with special emphasis on the utilization of the language laboratory. 3 units.* Professor Phelps

230. German Cultural History. A study of the backgrounds of German civilization and culture (Kulturkunde) in varying aspects and impacts from

earliest times down to the most recent. 3 units.*

232. Bibliography and Methods. An introduction to the tools and methods of research in Germanic philology and German literature. 3 units.°

233. Advanced Composition. Intensive study of syntax; practice in the writing of German prose, aiming toward the development of an expressive and fluent style. 3 units.°

For Graduates

- 316. The Austrian Novel from 1930 to the Present. Studies in the developmental novel as practiced by Hermann Broch, Robert Musil, and Heimito von Doderer within the framework of modern German literature. 3 units.* Professor Salinger
- —. Graduate Reading Course. An intensive course in German to develop rapidly the ability to read German in several fields. Graduate students only. No credit.

Related Courses in Other Departments

The following courses in other departments are recommended to students who are majoring in Germanics, as particularly valuable in building a proper background for Germanic studies:

(a) Graduate courses in foreign or comparative literature or philology, offered by the ancient and modern language departments, to be selected after consultation with the Germanics Department.

(b) Graduate courses in history and philosophy, offered by those de-

partments, to be selected after consultation with the Germanics Department.

History

Professor Colton, Chairman (235 Allen); Professor Durden, Director of Graduate Studies (236 Allen); Professors Alden, Crane, Curtiss, Ferguson, Hamilton, Holley, Lanning, Manchester, Parker, Preston, Ropp, Watson, and Woody; Associate Professors Acomb, Davis, Gillin, Hollyday, Lerner, A. Scott, W. Scott, B. Silberman and Young; Assistant Professor Ginter.

The Department of History offers graduate work leading to the M.A. and the Ph.D. degrees. A candidate for the degree of Doctor of Philosophy is required to prepare himself for examination in four fields, of which three shall normally be within history and of which one must be in American history or in the history of Western Europe. The choice and delimitation of fields is determined in consultation with his supervisor and the Director of Graduate Studies. The Department offers graduate instruction in Ancient History; Medieval Europe; Modern Europe; American History; England and the Commonwealth; Russia; Latin America; the Far East in the modern period; South Asia in the modern period; military history; and historiography.

Students may receive credit for either semester of a hyphenated course without taking the other semester if they obtain written permission from

the instructor and the Director of Graduate Studies.

For Seniors and Graduates

201-202. The History of Russia, 1801-1917. The development of the Russian Empire in its political, social, and economic aspects, and the growth of forces leading to its downfall. 6 units. Professor Curtiss

203-204. The United States, 1850-1900. The rise of sectionalism, secession, wartime problems of the Union and Confederacy, political and economic adjustments of Reconstruction, the status of the Negro, the New South, problems of capital and labor, the agrarian revolt, political parties

and reform. 6 units. Professor Woody

205-206. The United States in the Twentieth Century. The emergence of the United States as a major power; attention is focused on domestic developments and conflicting theories of expansion and federal power. Emphasis in the first semester is on the progressive era and the first World War; the second semester is devoted to the twenties and to the Franklin Roosevelt administration. 6 units. Professor Watson

209-210. Constitutional History of the United States, 1760 to the Present. A study of the basic problems in forming the Constitution; of its development through the major crises in the history of the United States;

of the effects of changing social, cultural, economic, and political condi-

tions on the Constitution. 6 units. (Not 1967-68)

212. Recent Interpretations of United States History. A course designed to encourage a critical evaluation of major issues in United States history through examination of recent interpretations of key problems. 3 units. Professor Watson

213-214. The Old South. Political thought and party trends from Jefferson to Calhoun; agriculture, slavery, expansion; commerce, manufacturing, transportation; urban life, religion, education; the rise of Southern

nationalism. 6 units. Professor Woody

215-216. The Diplomatic History of the United States. A study of the history of American diplomacy, with particular emphasis upon those factors, foreign and domestic, which have shaped the foreign policies of the Republic. 6 units. Associate Professor Davis

217, 218. Europe Since 1870. International relations since the Franco-German War is the chief subject of study in this course; special emphasis is placed upon the underlying economic and political influences. 6 units.

221-222. The Age of the Renaissance. The decline of characteristic features of medieval civilization and the rise of modern European institutions with particular attention to intellectual movements from Dante to Erasmus. 6 units. (Not 1967-68)

223-224. The Old Regime and the French Revolution, 1661-1815. A study of social, political, and intellectual revolutions in continental Europe, centering on France and giving special attention to successive interpretations of historical change. 6 units. Associate Professor Acomb

225, 226. The Age of the Reformation and Counter-Reformation. First semester: an advanced study of the years between 1517 and 1555, with particular reference to radical movements of reform. Second semester: the Counter-Reformation, 1555-1650. (Also listed as Religion 250, 251). 6 units. Associate Professor Hillerbrand

227, 228. Europe in the Nineteenth Century. A study, beginning with the career of Napoleon Bonaparte, of the forces and personalities influential in the nineteenth century. Emphasis in the first semester is on the problems of the biographer; in the second, on those of a student of national communities. 6 units. Professor Parker and Associate Professor Hollyday

229. Recent Interpretations of Modern European History. A course designed to develop the ability to appraise critical historical issues through the study and discussion of recent interpretations of key historical prob-

lems in modern European history. 3 units. Professor Parker

231-232. The Hispanic Colonies and Republics in America. First semester: the Spanish Conquest, the church, race and society; the development of universities, medicine, and science. Second semester: the wars of independence, the Mexican revolution since 1910, problems of land, education and public health. 6 units. Professor Lanning

233-234. The Institutional, Cultural, and Social History of Hispanic America. The first semester deals with the culture, society, and institutions of the Spanish colonies in America, and the second semester with those of the Hispanic American Republics. 6 units. Professor Lanning

235, 236. European Expansion Overseas. In the first semester attention is given to the age of discovery, and to the origin and the development of the great European overseas empires with special emphasis on the role of the Portuguese in India and the Americas. The work of the second semester deals with the decline of the mercantile empires, the emergence of independent centers of European culture overseas (Brazil being taken as an example), and the revival of mercantile imperialism in the late nineteenth and twentieth centuries. 6 units. (Not 1967-68)

237-238. Europe in the Middle Ages, 359-1500. Attention is given both to distinctive attributes of the period, such as feudalism and scholastic learning, and to such formative elements of European civilization as nationalism and the universities. 6 units. Associate Professor Young

241-242. Nationalism and Communism in the Far East. The growth of nationalism in China, the Japanese invasion of China, and the rise to power of the Chinese Communists. 6 units. Associate Professor Gillin

245-246. War in the Modern World. A historical study of the relations between warfare, politics, and technology from the Renaissance to the present. 6 units. Professor Ropp

247. The History of Modern India, 1757-1857. Historiography; expansion of Company power and influence; causes of the Mutiny; problems of

analysis and interpretation. 3 units. Professor Crane

248. The History of Modern India and Pakistan, 1857-1947. Historiography; Crown rule; social change; nationalism and modernization; Gandhian era and Muslim separatism; partition and problems of indepen-

dence. 3 units. Professor Crane

249-250. Social and Intellectual History of the United States. Evolution of American society and thought to the present; lectures and class discussions seek to illuminate the interplay of ideas and social practice by the examination of attitudes and institutions in such fields as science and technology, law, learning, and religion. 6 units. Professor Holley

251-252. Recent European History. A history of the political and economic developments in Europe since 1870. 6 units. Professor Colton

257. Social and Cultural History of the Hellenistic World from Alexander to Augustus. Lectures, readings, and discussions. This course will not be separately credited without the sequel, 258. 3 units. Rogers

258. Social and Cultural History of the Graeco-Roman World. The Roman Empire as the trustee of Hellenism and Christianity, and its own original contributions to modern civilization; lectures, readings, and discussions. This course continues 257 and will not be separately credited.

3 units. Professor Rogers 259-260. The Emergence of the New South, 1865 to the Present. Reconstruction, industrialization, and agrarian revolt; changing status of the Negro; the South's role in the reform movements headed by Theodore Roosevelt, Woodrow Wilson, and Franklin D. Roosevelt. 6 units. Professor Durden

261-262. Problems in Soviet History. Studies in the background of the Revolution of 1917 and the history and policies of the Soviet state. 6

units. Associate Professor Lerner

263-264. American Colonial History and the Revolution, 1607-1789. The founding and institutional development of the English colonies; the background, progress, and results of the Revolution. 6 units. *Professor Alden*.

265-266. Modern South America. Political, social, and economic history of leading South American nations from the mid-nineteenth century to the present. 6 units.

269. British History, 1688-1867. The Glorious Revolution, evolution of constitution, political methodology, Industrial Revolution, reforms, are among topics considered in context of the relationship of ideas and events. 3 units. Professor Hamilton

270. British History from Mid-Nineteenth Century. Liberals and Conservatives, Irish Home Rule, the empire, wars and economic decline, the welfare state. 3 units. Professor Hamilton

271-272. England, 1660-1832. Readings, discussion, and research in the relationships of political, social, and cultural life from the Restoration to the Reform Bill. 6 units. Assistant Professor Ginter

275-276. Central Europe, 1849-1914. Conflict between liberalism and authoritarianism, clash of nationalities, and domestic changes in Italy, Germany, and Austria-Hungary. 6 nnits. Associate Professor Hollyday

285. Origins of Indian Civilization. A study of the main sources and traditions of the classical civilization of the Indian subcontinent with particular attention to religious movements and institutions. (Also listed as Religion 285.) 3 units. Associate Professor Sullivan

287-288. History of Modern Japan. Description and analysis of the political, economic and social development of Japan since 1750 with emphasis on factors contributing to Japan's emergence as a modern state. 6 units. Associate Professor Silberman

297. The British Empire in the Nineteenth Century (From 1783). The development of the Empire from the American Revolution to the imperialism that culminated in the South African War. 3 units. Professor Preston

298. The Commonwealth in the Twentieth Century. The origins and evolution of the Commonwealth of Nations and its adjustment in the age of anti-colonialism. 3 units. Professor Preston

For Graduates

303-304. The United States in the Twentieth Century. The emergence of the United States as a major power; attention is focused on domestic developments and conflicting theories of expansion and federal power. Emphasis in the first semester is on the progressive era and the first World War; the second semester is devoted to the twenties and to the Franklin Roosevelt administration. 6 units. *Professor Watson*

305-306. Seminar in British History. The work consists of practical training in the methods of historical research based on sources for modern

British history. 6 units. Professors Ferguson and Hamilton

307-308. Seminar in United States History, 6 units. Professors Davis,

Durden, Holley, and Watson

309-310. Seminar in American Colonial and Revolutionary History. 6 units. Professor Alden

o units. Trojessor Atten

315-316. Seminar in Southern History. Year course. 6 units. Professor Woody

317-318. Seminar in the History of Western Europe. 6 units. Professors Colton and Parker, and Associate Professor Scott

321-322. Seminar in the History of Spain, Hispanic America, and Inter-

American Relations. 6 units. Professor Lanning

337-338. Seminar in Medieval History. 6 units. Associate Professor Young

343-344. Seminar in the History of American Foreign Relations. 6 units.

347-348. Seminar in Recent India. 6 units. Professor Crane

353-354. Seminar on the Second British Empire and the Commonwealth of Nations. 6 units. Professor Preston

361-362. Seminar in the History of Russia. 6 units. Professor Curtiss 401. Seminar in the British Commonwealth. 3 units. Professors Cole, Preston, and Spengler

Historiography and the Teaching of History

For Graduates

312. Seminar in the Teaching of History in College. The work in this course is intended to acquaint students with the problems involved in teaching history in college. It includes critical observation of the teaching by members of the History staff in Duke University. Year course. 2 units. Professor Holley

This course is required of all candidates for the degree of Doctor of Philosophy who are in residence as many as two years at Duke University.

320. Historiography. A critical study of the process of finding, appraising, and interpreting the sources of history and of the presentation of the results in narrative. Works of important historians from Herodotus to the present are analyzed. The student undertakes specific exercises in

research, criticism, and narration. There is consideration of such general topics as schools, theories, philosophies, and the function of history. Year course. 4 units. *Professor Parker*

This course is required of all candidates for the degree of Doctor of Philosophy who are in residence as many as two years at Duke University.

Hospital Administration

Professor Brown, Program Director (234-B Baker House); Professor Frenzel; Associate Professor Swanson; Assistant Professor Smith, Coordinator of Graduate Studies (234-B Baker House)

Graduate study leading toward preparation for a career of administration in hospitals and other health agencies is offered through a 24-month program leading to the M.H.A. degree. The program in Hospital Administration is composed of 36 graduate units, of which 18 are in Hospital Administration and 18 are in designated courses in Economics, Political Science, and Sociology. Included in the program is a 12-month administrative residency, a period of supervised administrative experience conducted under faculty supervision in hospitals and other health agencies located within commuting distance of the University campus. Admission to this program is limited to 16 students per year; selection is based on suitability for management of health agencies as well as on capability for graduate study. As there are requirements for participation in the program in Hospital Administration in addition to basic admission requirements of the Graduate School, interested individuals should obtain complete information on prerequisites and selection procedures from the Coordinator of Graduate Studies.

201. History and Development of Hospitals and Other Health Agencies. This course is designed to give the student a broad concept of the health field. It includes a study of the evolution of health institutions; analysis of medical care organizations in the United States, and the emergence

of the health professions. 3 units. Assistant Professor Smith

203-204. Principles of Organization and Management of Hospitals and Other Health Agencies. A study of the hospital as an institution including its administrative structure, relationship of the medical staff, and the organization and function of each department. At the same time study is made of the general principles underlying administration so that the student can relate these general principles to the hospital situation.

Emphasis is placed on the financial, legal, staffing, community relationship, and other managerial considerations of hospital administration. 6 units. Professors Brown and Frenzel, Associate Professor Swanson, As-

sistant Professor Smith

211-212. Seminars in Health Administration. A series of seminars designed to complement and add depth to the material covered during the

first year, to analyze further the operation of hospitals and other health agencies, and to make the experiences of the residency meaningful.

Attention will be given to formalized techniques of problem-solving, decision-making, human relations, communications, and relating day-today experiences to the management process.

Special emphasis will be placed on social and economic aspects of health care and on identifying and projecting current trends in the health

Staff and Preceptors field, 6 units.

215. Administrative Residency (1 calendar year). Designed to give the student broader and deeper knowledge and understanding of hospitals and other health agencies through practical experience. Varied experience is provided by rotation through a university medical center, a community hospital, a Veterans Administration and special hospitals, a public health department, a prepayment plan, and other governmental and voluntary health agencies. Two months of the residency will be spent in field experience with the Hospital Section of The Duke Endowment. 3 units. and Preceptors

Mathematics

Professor Roberts, Chairman (135C Physics Building); Professor Warner, Director of Graduate Studies (135D Physics Building); Professors Carlitz, Dressel, Elliott, Gergen, Murray, Shoenfield, and Woodbury; Associate Professors Burlak, Gallie, Reynolds, and Williams; Assistant Professors Bryson, Burdick, Hinrichs, Hodel, Kitchen, Patrick, Scoville, Smith, Stackelberg, and Srivastav; Adjunct Professor Sewell

Graduate work in the Department of Mathematics is offered leading to the A.M. and Ph.D. degrees. The student, in his undergraduate work, must have had courses in differential and integral calculus, and at least 6 semester hours of other courses in mathematics on the junior or senior level.

The A.M. degree with a major in mathematics is awarded primarily on the basis of scholarship. Of the 24 units of course work required for this degree, 18 units must be taken in the Department of Mathematics.

The Ph.D. degree in mathematics is awarded upon the demonstration of ability and training in research. The original dissertation, therefore,

is the most important of the formal requirements for the degree.

Since a reading knowledge of French, German, and Russian is highly desirable for the student of mathematics, he should satisfy the language

requirements in two of these languages as early as possible.

204. Geometry for Teachers. Metric and synthetic approaches to plane and solid geometry; affine geometry; and algebraic model of Euclidean geometry. 3 units. Associate Professor Reynolds

217-218. Intermediate Analysis. The real and complex number systems,

sequences and series, continuity, differentiation, integration. Prerequisite: Mathematics 64 for 217; and 217 for 218. 6 units. Assistant Pro-

fessor Stackelberg

221-222. Numerical Analysis. Introduction to scientific programming, introduction to numerical analysis, error analysis, interpolation, numerical differentiation and integration, summation, numerical solutions of ordinary differential equations, real and complex roots of equations, solution of simultaneous equations and matrix inversion, calculation of eigenvalues and eigenvectors, numerical solution of partial differential equations, linear programming and least-squares techniques. 6 units. Assistant Professor Patrick

227-228. Theory of Numbers. Congruences, arithmetic functions, compound moduli, quadratic reciprocity, Gauss sums, quadratic forms, sums of squares. Prerequisite: Calculus. (Not 1967-68) Professor Carlitz

229-230. Algebraic Numbers. Ideals, unique factorization, divisors of the discriminant, determination of the class number. Prerequisite: theory of equations. 6 units. (Not 1967-68) Professor Carlitz

233. Statistical Methods. Parameter estimation and hypotheses testing from samples, linear regression, correlation, analysis of variance and covariance, components of variance, multiple regression. 3 units. As-

sistant Professor Bryson

234. Sample Designs. Methods of constructing and analyzing survey designs; elements of simple random sampling, stratified sampling, multistage sampling; methods of estimation; questionnaire construction; refusals and not-at-homes. Prerequisite: Mathematics 233. 3 units. Assistant Professor Bryson

235-236. Abstract Algebra. Groups, rings, fields, vector spaces, polynomials, Galois theory, linear operators, inner product spaces. Prerequisites: Mathematics 114, or consent of the instructor. Assistant Profes-

sor Smith

244. Design of Experiments. Methods of constructing and analyzing designs for experimental investigations, Latin square, split-plot, simple and partially confounded factorial designs, incomplete block designs, treatment of missing data, techniques of experimentation. Prerequisite: Mathematics 233. 3 units. (Not 1967-68) Assistant Professor Burdick

245-246. Combinatorial Analysis. Generating functions, permutations, distributions, partitions, compositions, trees, and networks. Prerequisite:

calculus. 6 units. (Not 1967-68) Professor Carlitz

247-248. Arithmetic of Polynomials. Field theory, detailed study of finite fields, special polynomials and functions, valuation theory, the zeta function. Prerequisite: Mathematics 236, or consent of the instructor. 6 units. (Not 1967-68) Professor Carlitz

262. Non-Parametric Statistics. A study of statistical tests in which no assumption about the underlying distribution is made; one sample, two sample, k sample tests for nomial, ordinal and internal scales; non-para-

metric measures of correlation, efficiency of tests. Prerequisite: Mathematics 244, or consent of the instructor. 3 units. Assistant Professor Bryson

271-272. Introductory Topology. Basic set theory; topological spaces; separation axioms; metric spaces; continuity; connectedness; paracompactness. Prerequisite: calculus. 6 units. Assistant Professor Hodel

273-274. Algebraic Topology. Homology and cohomology theories; complexes; introduction to homotopy groups; Cech homology theory. Prerequisite: Mathematics 271-272. 6 units. (Not 1967-68) Assistant

Professor Hinrichs

283. Applied Mathematical Statistics. Basic probability concepts, the sample space, discrete and continuous events, permutations and combinations, conditional and marginal probability, discrete and continuous distributions, expected values and moments, sampling distributions, estimation, hypothesis testing, confidence intervals, basic queuing theory. Prerequisite: Mathmatics 64. 3 units. Assistant Professor Burdick

284. Least Squares Analysis of Linear Models. General linear models; geometrical interpretations; multiple regression; one-way and multi-way analysis of variance; fixed, random, and mixed models; experimental design models; analysis of covariance; introduction to non-linear models. Prerequisites: Mathematics 136 or 283. 3 units. Assistant Professor Burdick

285. Applied Mathematical Methods I. Vectors, line and surface integrals, tensors, complex variables, differential and integral equations. Prerequisite: Mathematics 64. 3 units. Professor Dressel and Assistant Professor Srivastav

286. Applied Mathematical Methods II. Wave equation, Fourier series, heat equations, telegraphic equations, Legendre polynomials, Bessel functions, Schrodinger's equation. Prerequisite: Mathematics 64. 3 units.

Professor Dressel and Assistant Professor Srivastav

287-288. Foundations of Mathematics. Propositional calculus, predicate calculus, axiomatized number theory. Godel completeness and incompleteness theorems. Recursive functions; hierarchies; constructive ordinals. Set theory; consistency of the axiom of choice. Prerequisite: Mathematics 114 or Philosophy 103, or consent of the instructor. 6 units. (Not 1967-68) Professor Shoenfield

289. Applications of Stochastic Processes I. Recurrent events, random walk, Markov chains and processes, queuing theory, branching and diffusion processes. Prerequisites: Mathematics 135 and 140, or consent

of the instructor. 3 units. Associate Professor Williams

290. Applications of Stochastic Processes II. Linear operators, spectral representations, time series, multivariate analysis, auto-regressive schemes, Gaussian processes, cross-correlation functions, smoothing, filtering, prediction, Wiener-Hopf Equation, diffusion processes, Fokker-Planck Equation, first-passage times. Prerequisite: Mathematics 289, or consent of the instructor. 3 units. Associate Professor Williams

291-292. Analysis I, II. Theory of analytic functions, measure and integration theory, introduction to functional analysis. Prerequisite: Mathematics 218 or 140, or consent of the instructor. 6 units. *Professor Warner*

For Graduates

303. Advanced Theory of Numbers. Cubic and quartic reciprocity, partitions and diophantine analysis. Prerequisite: Mathematics 228, or consent of instructor. 3 units. (Not 1967-68) Professor Carlitz

325-326. Analysis III, IV. Advanced topics in complex and real analysis, measure and integration theory, functional analysis. Prerequisite:

Mathematics 292 for 325; and 325 for 326. 6 units. Staff

327-328. Partial Differential Equations. Boundary and initial value problems, regularity and existence theorems by methods of a priori estimates and functional analysis. Representations of solutions, spectral theory, and potential theory. Prerequisite: Mathematics 291-292, or consent of the instructor. 6 units. * Associate Professor Burlak

329-330. Theory of Distributions. Test functions, distributions, topological vector spaces; applications to the operational calculus, partial differential equations, and mathematical physics. 6 units. Associate

Professor Burlak

333-334. Analytic Theory of Numbers. Distribution of primes, primes in an arithmetic progression, Waring and Goldbach problems, applications of elliptic functions. Prerequisite: Mathematics 291-292. 6 units. (Not 1967-68) Professor Carlitz

335-336. Topics in Algebra. Advanced topics in algebra to be selected from areas of current research. Prerequisite: Mathematics 236, or consent

of the instructor. 6 units. (1967-68) Assistant Professor Smith

343-344. Ordinary Differential Equations. Solution by separation of variables, exact differentials, integrating factors, solution in series. Cauchy's existence theorem, linear differential systems, singular points, partial differential equations equivalent to ordinary systems. Prerequisite: Mathematics 291-292. 6 units.° Staff

371-372. Dimension Theory. Theory of covers in normal spaces; inductive and covering dimension of metric spaces and of normal spaces; dimension of Euclidean spaces; mapping in spheres and applications; metric dimension and other metric-dependent functions. Prerequisite:

Mathematics 271-272. 6 units. Professor Roberts

383-384. Lie Groups and Algebras. Differential manifolds; Lie groups; one-parameter subgroups; Lie algebras; differential forms; classification and representations of compact Lie groups and semisimple Lie algebras; solvable and nilpotent algebras; Ado's theorem. Prerequisites: Mathematics 236, 271, and either Mathematics 218 or 291. (1967-68) Professor Shoenfield

M385. Mathematics of Physiological Systems. Solutions of physiological problems by automatic computation techniques. Principles of analog and digital computation-simulation and computation of mathematical models of biological systems developed from statistical and engineering approaches. Prerequisite: Consent of the instructors. (See also Physiology M385.) 3 units. Professors Moore and Woodbury.

395-396. Topological Algebra. Normed and locally convex spaces, Banach algebras. Prerequisites: Mathematics 236 and 292, or consent of

the instructor. 6 units. (1967-68) Professor Hinrichs

397-398. Seminar in Algebra and Number Theory. Prerequisite: Consent of the instructor. 6 units. (1967-68) Professor Carlitz

Microbiology and Immunology

Professor Conant, Chairman (321 Bell Building); Professor Day, Director of Graduate Studies (1540 Hospital [CRU]); Professors Amos, Beard, Larsh, Rundles, Smith, and Willett; Associate Professors Metzgar, Osterhout, Wheat, and Zmijewski; Assistant Professors Burns and Flanagan

The Department offers a Ph.D. degree in Microbiology (which embraces Immunology). A brochure may be requested from the Director of Graduate Studies, Box 3045, Duke Medical Center, which describes the degree program, the special requirements, and the fellowships available. Prerequisites for admission include adequate preparation in the physical as well as biological sciences.

For Seniors and Graduates

201. Advanced Microbiology. The nature of the growth, composition, structure, and metabolism of the microbial cell with emphasis on the molecular, biochemical, and immunochemical aspects. Prerequisites: organic chemistry or biochemistry. 3 units. (Spring 1967; fall 1967-68;

every subsequent fall). Associate Professor Wheat

231. Fundamentals of Immunology. A lecture course on general immunology including the following: non-specific factors in immunity, nature of antigens and antibodies, antibody production, complement, serological methods, blood groups, autoimmune diseases, tumor, immunity, transplantation immunity, and hypersensitivity. 2 units. (Spring Professors Amos, Day; Associate Professors Metzgar and Semester) Zmijewski

For Medical Students and Graduates

M211. Hematology. Three lectures and three laboratory periods of 3 hours each, weekly, for eleven weeks in the spring quarter. Prerequisites:

courses in general zoology, general botany, histology, and comparative

anatomy. 4 units. Professor Rundles

M221. Medical Microbiology. This course is devoted primarily to the study of the biological and immunological relationships of microorganisms (bacteria, fungi, Rickettsia, and viruses) in disease. Five lectures, two one-hour conferences, and three laboratory periods of 3 hours each, weekly, in spring semester. Prerequisites: courses in general zoology, general botany, histology and comparative anatomy, general and organic chemistry. 6 units. Professors Amos, Conant, Day, D. T. Smith, Willett; Associate Professors Metzgar, Osterhout, Wheat, and Zmijewski; Assistant Professors Burns and Flanagan

For Graduates

310. Microbial Physiology. A lecture course devoted to an analysis of the structure and composition of microbes as related to function and growth. Attention will be given to microbial metabolism with emphasis on mechanisms controlling the production and utilization of metabolites. Two lectures per week. Prerequisite: Biochemistry 201 or equivalent. (Spring, alternate years; given 1967.) Assistant Professor Burns

312. Tissue Immunology. An intensive and critical analysis of normal, neoplastic, embryonic, and diseased tissue antigens; qualitative and quantitative aspects of tissue antigen specificity; rational and irrational approaches to cancer immunity and to the immunotherapy of cancer. Prerequisites, Microbiology 231. 2 units. (each spring semester). Pro-

fessor Day

313. Immunohematology. A lecture and laboratory demonstration course covering the serological, genetic, and anthropological aspects of human blood groups isoantigens and antibodies. 2 units. Associate

Professor Zmijewski

314. Immunochemistry. The structure of antibody molecules. The nature of the combining site. The hapten as a molecular probe. Forces involved in antigen—antibody interaction. Specificity, avidity, and cross-reaction of antibodies. Purification of antibodies. Antibodies as analytical reagents. Prerequisites: Fundamentals of Immunology or Biochemistry or Physical Chemistry or consent of instructor. 2 units. (each fall semester) Professor Day

316. Immunogenetics. Production of inbred and coisogenic strains. Mutation and recombination in inbred animals and tumors. Genetic control of histocompatibility iso-antigens in tumors and normal tissues, differential gene action in hybrids and tumors. Antigenic and immunologic factors in homograft rejection, tests for genetic compatibility. Modification of the immune response by genetic or immunologic procedures—tolerance, enhancement, suppression of antigens. 2 units. Professor Amos

323. Readings in Bacteriology and Immunology. This course is intended primarily for graduate students majoring in bacteriology, but it is also available as a minor to other graduate students in related fields, to whom it is recommended by respective supervising committees and with the approval of the Department of Microbiology. Prerequisites: Bacteriology and Immunology, M221. 4 units per semester. Professor Smith

324. Research Seminar on Viruses. Limited to advanced students. 2

units per semester. Professor Beard

325. Medical Mycology. This course is intended to familiarize the graduate student majoring in mycology with the fungi causing disease in man and animal. The course includes practical laboratory work with materials from patients in Duke Hospital and those sent to the Duke Fungus Registry from outside sources. Prerequisites: A.M. in Botany with major in mycology and M221. Course limited to four students each year. 4 units per semester. Professor Conant

326-327. *Microbiology Seminar*. Graduate students and staff meet weekly to discuss and review recent microbiological literature. Required of all graduate students who are candidates for the A.M. or Ph.D. degree.

2 units. Staff

328. Seminar in Immunology. Selected topics on various aspects of immunology will be discussed. Seminars will be by both students and faculty. 1 unit. Fall semester. Staff

Pathology

Professor Kinney, Chairman (301B Medical School); Associate Professor Benjamin Trump, Director of Graduate Studies (301 Medical School); Professors Hackel, Kaufman, Vazquez, and Vogel; Associate Professors Fetter, Smith, Sommer, and Wittels; Assistant Professors Elchlepp and Sage

The graduate program in pathology is intended to prepare well-qualified individuals for a career in academic and experimental pathology and give them sound understanding of the structural and chemical processes which are involved in disease. The study of pathology brings together structure and function into one discipline by utilizing modern

chemical, biologic, and ultrastructural techniques.

M350. Human Pathology. The fundamentals of pathology are presented to the student. Lectures developing broad concepts of disease processes are given by the members of the senior staff. The emphasis is placed on etiology and pathogenesis of disease and the experimental approach to an understanding of disease. Prerequisite: by permission of instructor. Lecture and conferences. 4 units. Dr. Kinney and Staff

M351. Correlative Pathology. In this course gross and microscopic

material is correlated and related to disease processes. Laboratory and conferences with small groups of students are scheduled for the purpose of more intimate discussion. Laboratory and conferences. Prerequisite

or concurrent: Pathology 350. 4 units. Dr. Kinney and Staff

M352. Basic Problems in Chemical Pathology. This is an advanced seminar tutorial course in which the biochemical and physiological expressions or morphologic abnormalities will be explored. A specific organ system, namely the heart, will be used as a model for instruction and discussion. Experimental approaches toward solutions of problems will be discussed. Prerequisite: by permission of instructor. 2 units. Dr. Wittels

M353. Advanced Neuropathology. This course deals with current problems and research methods related to diseases which affect the nervous system. Prerequisite: by permission of instructor. 2 units. Dr.

Vogel

M354. Immunopathology. The first part of the course will deal with a conceptual approach to basic immunology with emphasis on immunologic theory of antibody synthesis, tolerance, and autoimmunity. In addition, an introduction to the methodology of immuno-chemistry will be given. The main aspect of the course will emphasize pathogenetic concepts of experimental and human diseases of "hypersensitivity origin" particularly the study of the function and morphology of pathologic states. Prerequisite: by permission of instructor. 2 units. Dr. Vazquez and Staff

M355, M356. Seminar in Pathology. Weekly discussions outlining the scope of modern pathology. This will include reports of original researches by members of staff and visitors. 1 unit each semester. Members

of Staff

M357. Research in Pathology. Independent research projects in various fields of pathology. Time and credit to be arranged. Members of Staff

M358. Cellular Ultrastructure in Pathology. This course is designed for students wishing to broaden their knowledge of cellular structure and cellular pathology. The course will consist of a series of lectures and seminars discussing the alterations in cellular structure and associated function that accompany cell injury. Prerequisite: by permission of instructor. 2 units. Dr. Trump and Staff

M359. Applied Instrumentation to the Field of Ultrastructural Pathology. Emphasis will be placed on the theory and application of electron microscopy to ultrastructural pathology. The methods relating to electron microscopy as well as phase and polarization microscopy will be con-

sidered. Lectures, seminars, and laboratories. 2 units. Prerequisite: Concurrent or previous enrollment in M358. Dr. Trump and Staff

M360. Enzymatic and Determinative Histochemistry. This course is designed for students who wish an understanding of the theoretical basis of the methods utilized for cellular and subcellular localization of chemical constituents of cells. The course consists of an intensive series of

lectures and laboratory sessions which emphasize modern techniques for tissue preservation and intracellular localization and identification of natural products and enzymes. In addition to formal experiments demonstrating the techniques, students will be encouraged to work on a selected project. 2 units. *Dr. Trump and Dr. Sommer*

Philosophy

Professor Baylis, Chairman (212D West Duke Building); Professor Welsh, Director of Graduate Studies (212A West Duke Building); Professors Clark, Negley, Peach, and Wilson; Assistant Professors Mahoney and Spector

The Department of Philosophy offers graduate work leading to the A.M. and Ph.D. degrees. Tutorial work complements formal instruction. Students may specialize in any of the following fields: the History of Philosophy; Logic; Philosophy of Science; Epistemology; Metaphysics; Philosophical Analysis; Ethics; Aesthetics; Political Philosophy and Philosophy of Law. Applicants for admission should offer scores of the Graduate Record Examination or the Miller Analogies Test. Scores are

required of applicants for an award.

Individual programs of study are developed for each student. The following requirements, however, are fundamental: (1) In February of their first year new graduate students are required to take two qualifying examinations to determine the student's fitness to continue in graduate work. One examination is in the history of philosophy, ancient and modern; one is on a central philosophical topic, treated systematically. In addition the student will take the logic preliminary examination. (2) The remaining preliminary examinations for the Ph.D., which may be taken only after a student has met the language requirements for that degree, should be taken during the first year of study beyond the A.M. degree or at the end of the second year. In these examinations students are expected to combine historical knowledge with critical understanding.

Work in a minor field outside of the Department, but not necessarily confined to any one department, must include six units for the A.M. or the Ph.D. and may include more as a student's program requires or permits.

For Seniors and Graduates

202. Aesthetics: The Philosophy of Criticism. A study of some fundamental issues in aesthetics with particular reference to the fields of literature, music and painting. Problems discussed include the role of standards in criticism, aesthetic judgment, interpretation and evaluation in litera-

ture, meaning in the arts, art and truth, the arts and morality. 3 units.

Professor Welsh

203. Contemporary Ethical Theories. Study of the nature and justification of basic ethical concepts and principles in the light of the chief ethical theories of twentieth-century British and American philosophers. 3 units. Professor Baylis

205. Philosophy of History. Discussion of the method, metaphysical implications and influence of interpretations of history: Hegel, Marx,

Spengler, Toynbee. 3 units. Professor Negley

208. Political Values. Analysis of the systematic justification of political principles and the status of political values in the administration of law. 3 units. Professor Negley

211. Plato. A critical study of the dialogues with special emphasis on

problems in ethics, epistemology, and metaphysics. 3 units.

217. Aristotle. A study of parts of the Organon, Physics, and Meta-

physics. 3 units. Assistant Professor Mahoney

- 218. Medieval Philosophy. An examination of the course of philosophy from the end of the ancient period to the fifteenth century. Special attention will be given to Augustine, Avicenna, Averroes, Albert the Great, Aquinas, Siger of Brabant, John of Jandun, Duns Scotus and William of Occam. 3 units. Assistant Professor Mahoney
 - 219. Kant. Reading and discussion of his philosophy, with some at-

tention to historical continuity. 3 units.* Professor Negley

225. British Empiricism. A critical study of the writings of Locke, Berkeley, or Hume, with special emphasis on problems in the theory of knowledge. 3 units. (1967-68) Professor Peach

- 227. Continental Rationalism. A critical study of the writings of Descartes, Spinoza, or Leibniz, with special emphasis on problems in the theory of knowledge and metaphysics. 3 units. (Not 1967-68) Professor Peach
- **228.** Recent and Contemporary Philosophy. A critical study of some contemporary movements in philosophy with special emphasis on the work of Moore, Russell, Wittgenstein, Wisdom, and Ryle. 3 units. *Professor Welsh*
- 229. American Pragmatism. Studies in the philosophy of Peirce, James, Dewey, and Mead. 3 units.* Professor Welsh
- 230. The Meaning of Religious Language. An analysis of the credentials of some typical claims of theism in the light of theories of meaning in recent thought. Prerequisite: Contemporary Theology 232-233, or consent of instructor. (Also listed as Religion 230.) 3 units. Associate Professor Poteat
- 233. Introduction to the Philosophy of Science. A systematic study of some central problems in the methodology of the sciences, e.g., the concept of a scientific explanation, the nature of laws, theory and observation, and other topics. 3 units. Assistant Professor Spector

- 234. Philosophy of Science. Selected problems in the philosophy of the physical and non-physical sciences. Topics such as space and time, measurement, probability and induction, and problems in the philosophy of the behavioral and social sciences. Prerequisite: previous work in the philosophy of science or consent of the instructor. (Not 1967-68). 3 units. Assistant Professor Spector
- 235. Philosophy and the Sciences. Selected problems in the philosophy and methodology of the sciences with emphasis on the writings of philosophers and scientists in the history of science, such as Galileo, Newton, Mach, Poincare, and Einstein. (1967-68). 3 units. Assistant Professor Spector
- 241. Logic. Fundamental Problems of Logic. 3 units.° Professors Clark and Wilson
- 246. General Semantics and Theory of Language. An examination of semantical theory through Frege, Russell, Carnap and Quine, together with a consideration of the implications of meaning theory for general philosophy. 3 units.* Professor Wilson
- **247.** Philosophical Cosmology. An examination of problems relating to the nature of individuals, space, time and causality. 3 units. (E) Professor Wilson
- 250. Philosophical Analysis. A critical study of recent and contemporary essays in philosophical analysis, and an evaluation of the nature, methods, and results of this movement. 3 units. Professors Baylis and Clark
- **252.** *Metaphysics.* A critical and evaluative study of rival metaphysical theories and their bases. Analysis of the fundamental metaphysical categories and of metaphysical methods. 3 units. *Professor Baylis*
- 287-288. Foundations of Mathematics. Propositional calculus, predicate calculus, axiomatized number theory. Godel completeness and incompleteness theorems. Recursive functions; hierarchies; constructive ordinals. Set theory; consistency of the axiom of choice. Prerequisite: Mathematics 53, or consent of instructor. 6 units. (Also listed as Mathematics 287-288.) Associate Professor Shoenfield
- 291, 292. Critical Philosophy. The analysis of basic philosophical concepts and beliefs with a view to critical evaluation and constructive emendation of them. Emphasis on the practice as well as the principles of philosophical criticism and problem-solving. 3 units each. Enrollment only by permission of the Department. 291 is ordinarily prerequisite for 292. All Members of the Graduate Staff

For Graduates

331, 332. Seminar in Special Fields of Philosophy. 3 units. All Members of the Graduate Staff

Professor Fairbank, Chairman (119 Physics Building); Professor Greuling, Director of Graduate Studies (211-B Physics Building); Professors Biedenharn, Danos, Fowler, Gordy, Lewis, Meyer, and Newson; Adjunct Professor Robl; Associate Professors Bilpuch and Robinson; Assistant Professors Beres, Carpenter, Evans, Fortney, Guyer, Huber, Hunt, Roberson, and Walter; Instructors Cook and Holman

The Department of Physics offers graduate work leading to the A.M. and Ph.D. degrees. Course work is designed to give a broad basic foundation in classical and modern physics. All graduate students will be expected to acquire a thorough knowledge of the various branches of classical physics and some familiarity with modern physics and with basic laboratory skills. They will be required to take such course work in the 200-number courses as may be necessary to obtain this foundation.

The student will be required to take such course work as will best be adapted to the kind of work he will subsequently specialize in and to the kind of research he will undertake. The choice of minor will be similarly

determined.

Since a practical reading knowledge of French and German is highly desirable for the student of physics, he should satisfy these language requirements as early as possible.

For Seniors and Graduates

201-202. Mechanics. The fundamental principles of Newtonian mechanics; general dynamics of systems of particles and rigid bodies; the methods of Lagrange and Hamilton; generalized mechanics. Prerequisite: Physics 125. 6 units. Assistant Professor Fortney, Adjunct Professor Robl

215. Introduction to Quantum Mechanics. Wave mechanics and elementary applications; the hydrogen-like atoms; electron spin and angular momentum; operators and eigenvalues; stationary state perturbation theory; identical particles. Prerequisites: Physics 162, 192 or equivalents; Math. 285-286 may be taken concurrently. 3 units. Assistant Professor Evans

217-218. Advanced Physics Laboratory. Measurements involving the fields of mechanics, electricity, magnetism, heat, sound, optics and modern physics. 2-6 units. Professor Meyer

220. Advanced Electronics. Vacuum tubes and solid state devices, ad-

vanced circuit analysis. 3 or 4 units. Assistant Professor Hunt

221-222. Theoretical Physics. Mechanics of particles and of rigid bodies, elasticity, fluids dynamics, electrodynamics; optics, relativity, thermodynamics, statistical mechanics, wave mechanics. Prerequisite: Mathematics 285-286 or equivalent to be taken at least concurrently. 6 units. Instructor Cook

223. Electricity and Magnetism. Electrostatics, magnetostatics, and potential theory; dielectric and magnetic media; magnetic field of currents and the law of induction. Maxwell's electrodynamics. Prerequisite: Physics 126. 3 units. Associate Professor Robinson

For Graduates

303, 304.° Thermodynamics, Statistical Mechanics. Fundamental laws of thermodynamics and statistical mechanics with applications to physics and chemistry. Properties of gases and elements of quantum statistics.

6 units. Assistant Professor Guyer

305. Introduction to Nuclear Physics. Phenomenological aspects of nuclear physics; interaction of gamma radiation and charged particles with matter; nuclear detectors; particle accelerators; radioactivity; basic properties of nuclei; nuclear systematics; nuclear reactions, particle scattering; nuclear models; the deuteron; nuclear forces; parity. 3 units. Assistant Professor Walter

306. Low Temperature Physics. The properties of matter near the absolute zero of temperature; superconductivity, liquid helium, adiabatic demagnetization. Prerequisite: Physics 303. 3 units.* Professor Fair-

bank

308. Introduction to High Energy Physics. Cosmic rays; mechanisms of energy loss by very high energy particles; accelerators; present status of strong and weak interactions; parity; charge conjugation violation. 3 units. Professor Fowler

309. Solid State. Matter in the condensed state, including metals, insulators and semiconductors; theory of cooperative effects; thermal and magnetic properties of matter. Prerequisite: Physics 303. 3 units. As-

sistant Professor Guyer

310. Advanced Solid State Physics. Scattering from many particle systems; Fermi liquids; systems of bosons; superconductivity. Prerequi-

site: Physics 316. 3 units. Assitant Professor Guyer

316. Principles of Quantum Theory. Original and fundamental concepts of quantum theory; wave and matrix mechanics; theory of measurements; exclusion principle and electronic spin. Prerequisite: Physics 201-202. 3 units. Professor Biedenharn

317. Intermediate Quantum Theory. General operator methods; angular momentum; Dirac electron theory. Second quantization; symmetry principles and conservation theorems. Applications to the theory of solids, of nuclei, and of elementary particles will be stressed. Prerequisite:

Physics 316. 3 units. Assistant Professor Evans

318-319. Electromagnetic Field Theory. Electrodynamics; theory of wave optics; radiation of electric and magnetic multipole fields; special relativity; covariant electrodynamics; Lienard-Wiechert potentials; scattering and dispersion; Hamiltonian field equations. Prerequisite: Physics 223. 3 units. Professor Greuling

331. Microwave Radiation. Microwave generators, cavity resonators, transmission lines, radiation propagation and detection. 3 units.* Pro-

fessor Gordy

335. Microwave Spectroscopy. Application of microwaves in the determination of molecular, atomic, and nuclear properties. Stark and Zeeman effects in microwave spectroscopy. Magnetic resonance absorption. 3 units.* Professor Gordy

341. Advanced Topics in Quantum Theory. Quantum theory of radiation and collisions with special reference to nuclear and high energy physics. Prerequisite: Physics 317. 3 units ** Professor Biedenharn**

- 342. Theory of Elementary Particles. Theoretical methods used in treating particle interactions, emphasizing phenomenological treatments. Quantum field theory and dispersion theory is developed as needed. Applications in the general areas of pion physics, electromagnetic interactions of hadrons, strange particle interactions, and weak interactions are surveyed. Prerequisite: Physics 316. 3 units. Assistant Professor Evans
- 343. Nuclear Physics. Elementary theory of the deuteron; low energy neutron-proton scattering; theory of nuclear reactions; penetration of potential barriers; nuclear energy levels. Prerequisite: Physics 215. 3 units.* Professor Newson
- 344. Advanced Nuclear Physics. The deuteron, nuclear forces, scattering of elementary particles, beta-radiation. Other aspects of nuclear physics susceptible of theoretical interpretation. Prerequisite: Physics 343. 3 units. Visiting Professor Danos

345. High Energy Physics. Experimental and theoretical aspects of high energy nuclear processes; properties of mesons and hyperons. 3 units.

(1967-68) Assistant Professor Fortney

346. Topics in Theoretical Physics. The content of this course will vary from year to year. General methods in quantum mechanics such as: group theory and its applications; elementary particle theory; field theory; theory of solids; theoretical nuclear physics; atomic and molecular structure. The topic for Spring 1967 will be Quantum Electronics. Prerequisite: Physics 316, 317. 3 units. Adjunct Professor Robl

351-352. Seminar. A series of weekly discussions on topics related to the research projects under investigation in the department. **2-4** units.

Members of the Graduate Staff

Physiology and Pharmacology

Professor Tosteson, Chairman (201 Medical School); Professor Kostyo, Director of Graduate Studies (251 Medical School); Professors F. Bernheim, Blum, Bressler, Horowicz, Moore and Renkin; Associate Professors

Bentley, Johnson, Jöbsis, Long, Ottolenghi, Salzano and Somjen; Assistant Professors Hochstein, Lack, McManus, and Narahashi

In the Department of Physiology and Pharmacology graduate work is offered leading to the A.M. and Ph.D. degrees. Before undertaking graduate work in physiology or pharmacology a student should have a strong background in basic science including course work in mathematics, chemistry, physics and biology. Students are accepted for graduate work who have undergraduate majors in any of the following areas: biology, chemistry, physics, engineering. A brochure is available from the department which describes the program of study, financial assistance, facilities, and the research activities of the staff.

M204. Topics in Muscle Physiology. This course will cover the following topics: Cellular basis of activity in skeletal, cardiac, and smooth muscle; ionic properties of muscle membranes; submicroscopic structure of muscle and the molecular basis of contraction; the problem of electromechanical coupling; the mechanics and thermodynamics of muscular contraction; design and control problems for the production of movement in various animals. 2 units. Professor Horowicz

M205. Physiological Models. This course is primarily intended for students with some background in electrical engineering. It will cover the following topics: energy transformation and storage in single cells; membrane model circuit diagrams and cable properties; membrane nonlinear-current relations: nerve impulse transmission; excitation and inhibition; mechanics and thermodynamics of muscles; electrical analysis of cardiovascular-respiratory systems. 3 units. Professor Moore

M260. Cellular Aspects of Drug Action. An introduction to cell-drug interaction with emphasis placed on mechanisms of action and structure-activity relationships of chemical agents. Prerequisites: organic chemistry, introductory animal or plant physiology. Undergraduates by permission of instructors. 1 unit. Professor F. Bernheim and Associate Professor Ottolenghi

M261. Introductory Physiology. An introduction to the basic concepts of physiology with particular reference to man. Three lectures, one laboratory and one conference per week. Fall term. 6 units. All Mem-

bers of the Graduate Staff

M271. Foundations of Contemporary Physiology. Contemporary physiology taught from the current literature. Prerequisite: Physiology M 261 or the equivalent. 4 units. All Members of the Graduate Staff

M272. Foundations of Contemporary Pharmacology. Contemporary pharmacology taught from the current literature. Prerequisites: Physiology M 261 and Pharmacology M 369 or the equivalent. 4 units. All Members of the Graduate Staff

M279. Student Seminar in Physiology. Weekly lectures by advanced students in the Department on some aspect of physiology or phar-

macology. Required of all graduate students majoring in physiology or

pharmacology. 1 unit. All Members of the Graduate Staff

M281. Physiological Instrumentation. The following topics are covered: Bridges, amplifiers, feedback, potentiometers, recorders, measurements of bioelectric potentials and current, position, velocity, flow, pressure and data reduction techniques. 3 units. Professor Moore

M322. Biomathematics. Both analog and digital computational methods which are useful for simulation and computation in the analysis of selected physiological systems are discussed. 3 units. Professor

Moore and Professor Woodbury (Biomathematics)

M367. Physiology of Cell Growth and Development. Topics to be covered will include: population kinetics, thermodynamics of growth, the timing of events of the cell cycle, molecular aspects of mitosis, and

the duplication of cell organelles. 2 units. Professor Blum.

M368. Cardiac Physiology and Pharmacology. Structure and function of cardiac muscle. Structure of fibers and their geometrical arrangement. Electrical properties of cardiac muscle fibers, generation of the cardiac action potential. Contraction; mechanics of cardiac muscle. Mechanisms of intrinsic and extrinsic control of contractility. Pharmacodynamics of cardio-active drugs. 2 units. Associate Professor Johnson

M369. Pharmacology. Mode of Action of Drugs. Studies and discussions of the pharmacological action of drugs in terms of biochemical and physiological processes. Lectures, conferences, and laboratory. Prerequisite: M261 or equivalent. 4 units. All Members of the Graduate Staff

M370. Seminar. A weekly meeting in which original researches by members of the staff and guests are reported. Required of all graduate students who are candidates for the M.A. or Ph.D. degree. 2 units. All

Members of the Graduate Staff

M371. Topics in Pulmonary and Cardiovascular Physiology. This course is concerned with processes which account for exchange of gases with the atmosphere, transport of O₂ and CO₂, flow-pressure relations in the gas and blood streams, and factors which disturb the exchange of gases in the pulmonary and systematic capillaries. 2 units. Associate Professor Salzano

M372. Research. Individual investigations in the various fields of physiology. Credits to be arranged. All Members of the Graduate Staff

M373. Cellular Endocrinology. Current concepts of the mechanism of action of hormones are covered with special reference made to the effects of hormones on cell membrane permeability and on the activity of enzyme systems. The relationships of these cellular actions of hormones to the hormonial regulation of growth, metamorphosis, osmoregulation, pigmentation and reproduction are discussed. 2 units. Professor Kostyo

M374. Cellular Neurophysiology. Deals with current concepts of structure and electrical impulse propagation in nerves. The powerful new experimental techniques used in the study of isolated membranes and the

resulting theoretical models are covered. 2 units. Professor Moore and Assistant Professor Narahashi

M376. Cellular Metabolism and Energetics. The metabolic activity of cells will be considered from the point of view of the flow of energy through the cell. Special attention will be given to the mechanisms which couple the energy-providing systems to the energy-utilizing systems. Prerequisite: Physiology M261 and Biochemistry 201 (or equivalent). 2 units. Associate Professor Jöhsis

M377. Cellular Transport Processes. A sequential study of the following topics: The physical chemistry of transport processes which occur in living cells (e.g. diffusion, flow, electric current); contemporary knowledge of the molecular mechanism of salt and water transport across cell membranes with special reference to the conversion of chemical bond energy to transport work in active transport; the integration of transport processes in individual plasma membranes to accomplish regulation of cytoplasmic salt and water composition and cell volume, as well as the secretion of fluids across epithelial cell layers in organs specialized for this function (intestine, kidney). 2 units. Professor Tosteson and Assistant Professor McManus

M378. Reproduction. A lecture and laboratory course dealing with mammalian reproduction. The rat and rabbit will serve as the principal laboratory subjects. The following areas will be covered: embryology of the reproduction system; gonadal structure, gametogenesis and hormone production; structure and function of the diencephalic-pituitary system; structural, chemical, and behavioral actions of sex hormones; mechanisms of fertilization and implantation; placental structure and function; lactation. Admission with approval of instructors. (Listed also as Anatomy M378.) 4 units. Professor Everett (Anatomy) and Professor Kostyo

M379. Physiology of the Central Nervous System. The literature concerned with the integrative aspects of neurophysiology will be explored with emphasis upon the mammalian nervous system. Topics to be considered include: properties of central neurons, synaptic excitation and inhibition, reflex organization of the spinal cord, receptor organs and sensory codes in the central nervous system, organization of motor functions and integration of autonomic functions. Prerequisite: Physiology M261 or equivalent. 2 units. Associate Professor Somjen

M₃8₅. Mathematics of Physiological Systems. Solutions of physiological problems by automatic computation techniques. Principles of analog and digital computation—simulation and computation of mathematical models of biological systems developed from statistical and engineering approaches. Prerequisite: Consent of the instructors. (See also Mathematics M₃8₅.) 3 units. Professors Moore and Woodbury

Professor Hallowell, Chairman (307 Library); Professor Proctor, Director of Graduate Studies (103 Carr); Professors Ball, Braibanti, Cole, Kulski, Leach, Rankin, and Wilson; Associate Professors Hall and Howard; Assistant Professor Kornberg

The Department of Political Science offers graduate work leading to the A.M. and Ph.D. degrees. Before being admitted to candidacy for the Ph.D. degree, an applicant is normally expected to have qualified for the

A.M. degree.

Instruction is designed to prepare the student for teaching, and research for government service, and for other work related to public affairs. Before undertaking graduate study in political science, a student is ordinarily expected to have completed at least 12 semester hours of course work in political science, including some work in American government.

Fields of political science in which instruction is at present offered for candidates for the degree of Doctor of Philosophy are the following: American Government and Constitutional Law; Comparative Government and Politics (with special reference to Western Europe, Southern Asia, the Soviet Union or the Commonwealth); Political Theory; American State and Local Government; International Law and Relations; Public Administration; Political Parties and Voting Behavior. Candidates for the degree of Doctor of Philosophy in political science must elect five fields including Comparative Government and Political Theory; at least one of the five fields must be taken in a department other than the Department of Political Science.

For Seniors and Graduates

207. American Constitutional Law and Theory. A study of leading principles of American government, as developed through judicial interpretation of the Constitution. 3 units. Professor Rankin

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208. American Constitutional Law and Current National Problems. A study of the influence of recent Supreme Court decisions upon the political and constitutional development of the United States. 3 units. Professor Rankin

209. Problems in State and Local Government in the United States. A study of the historical development of the state and local governments, their present organization and subdivisions and their relation to each other. Special attention is given to the position of the states in the federal union through the study of federal-state, inter-state, and state-local relations. 3 units. Professor Leach

220. Problems in International Politics. Among the topics considered are nuclear power, bipolarity and polycentrism, nationalism, national

interests and ideology, the revolution of modernization, and regional

integration. 3 units. Professor Kulski

221. International Public Organization. A study of the structure and functioning of the United Nations organs, of related specialized agencies such as the International Labor Organization, and of regional agencies such as the Organization of American States and the North Atlantic Treaty Organization. 3 units. Professors Ball and Wilson

222. Empirical Theory and Methodology. The research process in political science in terms of the possibilities for the quantitative analysis of data. Emphasis is on the construction of empirical theory, particularly conceptualization, hypothesis formation and testing. Careful consideration is given to the logic and mechanics of data collection and processing. 3 units. Assistant Professor Kornberg

223. Political Philosophy from Plato to Machiavelli. An intensive analysis of the political philosophies of Plato and Aristotle followed by a survey of medieval political thought and an analysis of the significance of

Machiavelli. 3 units. Professor Hallowell

224. Modern Political Theory. An historical survey and philosophical analysis of political theory from the beginning of the seventeenth to the middle of the nineteenth century. Attention is given to the rise of liberalism, the Age of Enlightenment, the romantic and conservative reaction, idealism and utilitarianism. 3 units. Professor Hallowell

225. Comparative Government and Politics-Western Europe. Modern political institutions and processes in Western Europe. 3 units. sor Cole

227-228. International Law. Elements of international law, particularly as interpreted and applied by the United States; rights and duties of states with respect to recognition, state territory and jurisdiction, nationality, diplomatic and consular relations, treaties, treatment of aliens, pacific settlement of disputes, international regulation of the use of force, and collective responsibility. 6 units. Professor Wilson

229. Recent and Contemporary Political Theory. The rise of positivism and its impact upon modern political thought, the origins of socialism, Marxism and its variants, socialism in the Soviet Union, nationalism, Fascism and National Socialism, the crisis in modern democracy, Chris-

tianity and the social order. 3 units. Professor Hallowell

230. American Political Institutions. A study of the formation and development of institutions of the national government in the United States, with historical and analytical treatment. Among other topics, this course is concerned with the Constitutional Convention of 1787, and the development of Congress, the Presidency, and the Supreme Court. 3 units. Professor Rankin

231. American Political Theory. An analysis of the main currents in American political thought from colonial beginnings to the present day, with emphasis upon the development of liberalism in America. 3 units.*

Professors Hallowell and Leach

234. Civil-Military Relationships in American Government. A consideration of the role of the military in American government both in practice and in theory. Special emphasis will be given to formal civil-military structural arrangements for determining policies such as the National Security Council, and to the degree of civilian control within the military establishment. 3 units.°

235. The British Commonwealth. An analysis of the political relationship between the members of the Commonwealth and a comparative study of the political systems of the Commonwealth countries, with particular reference to Canada. A course designed in part to utilize the occasional services of visiting professors from Commonwealth countries.

3 units. Professor Cole

241. Administrative Management. An advanced course in public administration with special attention being given to the development of scientific management, its application to government in the United States, and a consideration of current problems in organization, procedures, work simplification, and management improvement. 3 units. Associate Professor Hall

242. National Administration. A study of the administrative organization, working concepts and procedures of the United States Government, illustrated through the operations of the Bureau of the Budget. 3

units. Associate Professor Hall

244. Administrative Law and Process. The nature and law of the administrative process in the context of American government and politics, with special attention to the powers, procedures, and judicial control of administrative agencies. 3 units. Associate Professor Hall

246. Government Administration and Public Policy. Through use of the laboratory and case study techniques, a consideration of the types of administrative problems that the United States Government encounters in

the field of public policy, and their possible solution. 3 units.*

249. Comparative Political Analysis and Political Development. General methodology of comparison of political systems. Institutional, structural, functional, and configurative modes of analysis. Theory of political development. Theoretical problems of induced political change. Required of all doctoral candidates. 3 units. Professor Braibanti

250. Comparative Government and Politics—Southern Asia I. Political development of India and Pakistan. Contextual determinants of the political systems. Political consequences of partition. National integration, constitutional and institutional aspects of the political systems. Impact of foreign technical assistance. 3 units. Professor Braibanti

251. Comparative Government and Politics—Southern Asia II. The political development of India and Pakistan with emphasis on politiciza-

tion, administrative reform, party politics and the rural development movements. 3 units. Professor Brailbanti

275. The National Party System. An intensive examination of selected facets of American national political parties, such as relationships between presidential and congressional politics, the politics of national conventions, and the controversy over party government. 3 units. Assistant Professor

Kornberg

276. Comparative State Parties and Politics. A selective analysis of party patterns in the states, including such topics as: classification schemes for state party systems, the impact of various nominating procedures on party organization, relationships between national and state politics, and the influence of party system on the operation of state government, with special attention to the South. 3 units.

280. Comparative Government and Politics-Sub-Saharan Africa. Particular attention will be given to traditionalism and modernization, ideologies, leadership, party systems, the adaptation of parliamentary institutions, Africanization of the civil services, and the problem of

political integration. 3 units. Professor Proctor

285. The Judicial Process. A study of judicial decision-making in the United States. Attention will be focused on the institutional setting and the process of litigation, the recruitment and political socialization of judges, the influences and limitations on judicial decision-making, and the impact of judicial decisions within the political system. Prerequisites: Political Science 127, 207, or their equivalents. Not open to students who have completed Political Science 128. 3 units. Associate Professor Howard

291. Problems of Urban Government. An analysis of problems arising from the structure and functions of urban governments in the United States with particular attention to the current problems of metropolitan

areas. 3 units. Professor Leach

292. Urban Administration. A study of the administration of governmental programs and policies by governments in metropolitan areas with special attention to problems of organization, jurisdiction, and administrative responsibility. 3 units.* Professor Leach

For Graduates

301-302. Departmental Graduate Seminar. An introduction to research methodology, inter-disciplinary relationships, and current research problems. Required of all graduate majors in political science. No credit. All Members of the Graduate Staff

310. Seminar in State Government. Open to students who have com-

pleted course 209 or its equivalent. 3 units.*

312. Seminar in Constitutional Law. Open to students who have completed courses 207 and 208 or their equivalents. 3 units. Professor Rankin

321. Seminar in Political Theory. Open to students who have completed 6 units in Political Science 223, 224, 229, 231 or their equivalents. 3 units. Professor Hallowell

325. Seminar in Comparative Government and Politics. Open to students who have completed 6 units in Political Science 225, 249, 250, 251,

280 or their equivalents. 3 units. Professor Cole

328. Seminar in International Law. Open to students who have com-

pleted course 227-228 or its equivalent. 3 units. Professor Wilson

330. Seminar in Comparative Government and Politics—Southern Asia. Emphasis on research using documentary materials relating to India, Pakistan, Ceylon, and Malaya. Open to students who have completed courses 250, 251 or their equivalents. 3 units. Professor Braibanti

341. Seminar in Public Administration. Directed reading, discussion and reports concerning the theory and practice of public administration.

3 units.*

360. Seminar in Government and Politics in the Soviet Union. Open to students who have completed course 165, or on individual approval. 3 units. Professor Kulski

361. Seminar in Foreign Relations of the Soviet Union. Open to students who have completed courses 165 or 360, or on individual approval.

3 units. Professor Kulski

376. Seminar in Political Behavior. Open to students who have completed courses 275 and 276 or their equivalents, or by special approval of the instructor. 3 units.

401. Seminar in the British Commonwealth. 3 units. Professors Cole,

Preston, Spengler, and Braibanti

410. Seminar in the Government, History, and Social Structure of India and Pakistan. 3 units.* Professor Braibanti and Associates

Related Course Work in the School of Law

There may be graduate credit for course work completed in the Duke University School of Law, under regulations referred to on page 52 of this *Bulletin*.

Psychology

Professor Alexander, Chairman (240 Psychology-Sociology Building); Professor Guttman, Director of Graduate Studies (231 Psychology-Sociology Building); Professors Adams, Brehm, Dai, Diamond, Jones, Kimble, and Wallach; Associate Professors Altrocchi, Banham, Borstelmann, Carson, Erickson, Lakin, Schiffman, and Wing; Associate Research Professor Gaffron; Assistant Professors Erickson, Kremen, Linder, Lockhead, and Singer; Lecturers Botwinik, Cohen, Crovitz, E., Crovitz, H., Eisdorfer,

Feather, Gehman, Huse, Krugman, Obrist, Peele, Shmavonian, Somjen,

Stedman, and Thompson

The Department offers work leading to the A.M. and Ph.D. degrees. For the Ph.D. degree the areas of concentration are: theoretical experimental psychology, including physiological and comparative psychology; social psychology; and personality clinical psychology. All fields of specialization presuppose thorough preparation in the general methods, data, and theories of psychology. Programs of study are typically arranged to provide this common background in the first year or two, with increasing specialization in course work and research in subsequent years. Early in the second year of residence, the Ph.D. student is expected to have planned his further program of specialized studies; by the end of the second year, when the preliminary examination is normally taken, the doctoral dissertation plan should be formulated. An original dissertation demonstrating independent research competence and scholarship is the most important formal requirement for the Ph.D. degree.

Students specializing in clinical psychology undertake field work in a variety of settings, and an integral part of this program is a one-year internship in an approved and appropriate institution. Clinical internship is arranged for the third year of study or later year, depending on the

student's progress and needs.

Minor work in a variety of fields is available, but the areas most relevant to graduate work in psychology are the biological sciences (zoology, neuroanatomy, physiology), mathematics and statistics, sociology and anthropology, and philosophy of science.

Basic preparation in statistics and quantitative methods is normally obtained in the Department of Mathematics. Enrollment in Math 233 and

Math 244 is usually required in the first year.

Further details concerning the program of studies in psychology may

be obtained from the Director of Graduate Studies in Psychology.

203. Sensation and Perception. An examination of the classical concepts in sensation and perception and of the resulting psychophysical data for each of the major senses with emphasis on vision and audition. Modern perceptual formulations are discussed through analysis of the empirical evidence in support of each view. 3 units. Assistant Professor Lockhead

204. Comparative Psychology. The study of behavior as related to species and of speciation as dependent upon behavior; instinct, imprinting, and learning at different phylogenetic levels. 3 units. Professor

Adams

205. Interpersonal Processes. The determinants of attraction and hostility between persons and cognitive processes in relation to social interaction. Experimental derivations from cognitive consistency theories and exchange theories. Open to undergraduates, prerequisite: Psychology 101. Assistant Professor Linder

213. Conditioning and Learning. A presentation of the topics of clas-

sical and instrumental conditioning. Emphasis is upon the empirical laws

of simple learning. 3 units. Professor Kimble

214. Behavior and Learning Theory. An examination of concepts and principles of learning and of empirical findings in relation to various analyses of behavior mechanisms and definitions of behavioral units. 3 units. Professor Guttman

215. Developmental Psychology. A consideration of selected research areas in child behavior and development, including personality, cognition, perception and learning. 3 units. Associate Professor Borstelmann

216. Biological Psychology. The methods of biology (as applied to psychology), especially in neurophysiology, neuroanatomy and genetics. Topics covered include: (a) the genetics of behavior, (b) the organization of the dorsal thalamus and neocortex, (c) the limbic system and hypothalamus. Methods covered include: (a) ablation method, (b) method of evoked potentials, (c) electrical stimulation of the brain, (d) classical and physiological genetics. 3 units. Professor Diamond

217. Research Methods in Social Psychology. The theory and practice of data collection methods in social psychology. Emphasis is on the relation of theories, statistical hypotheses, and operational definitions. The methods include formal scaling procedures, systematic observational techniques, and others appropriate to field studies, field experiments, surveys and laboratory experiments. 3 units. Professor Brehm and

Assistant Professor Linder

218. Social Psychology. An examination of selected problem areas in social psychology including social factors in cognition, models of social interaction, conformity and social influence, and attitude development and change. Recent research is emphasized in relation to its historical context and its bearing on the development of theory. 3 units. Professor Jones

- 220. Physiological Bases of Behavior. Classical studies of the neurophysiology of learning and of behaviors such as hunger, thirst, and sex are examined. Emphasis is on the neural, hormonal, and developmental bases of motivational behavior. 3 units. Assistant Professor C. Erickson
- **234.** Seminar in Personality. A detailed consideration of selected research topics of current interest in the experimental study of personality, including risk-taking, creativity, and cognitive styles. 3 units. Professor Wallach
- 236. Theoretical Psychology. Survey of representative systematic formulations and schools in historical sequence. Study of relationships between various philosophical, scientific, and cultural thought-patterns and the forms of psychological theories. 3 units. Professor Guttman

237. Functional Neurophysiology. This course considers the mechanisms of activity of the individual neuron and groups of nerve cells, the principles of activity of the afferent and efferent neural system, and the

integrative and associative functions of the nervous system. Laboratory demonstrations and participation. 3 units. Associate Professor Erickson

238. The Electroencephalogram and Psychological Function. A survey of experimental and clinical literature on brain wave correlates of intelligence, personality, behavior disorders, epilepsy, sleep, sensory stimulation, conditioning and learning. Lectures, laboratory demonstrations, and

clinical case presentations. 3 units. Lecturer Obrist

239. Behavioral Correlates of Brain Damage in Man. A study of the effects of brain damage on psychological functioning. Known brain-behavior relationships in man will be reviewed, and problems encountered in the study of brain function in man will be emphasized. Laboratory demonstrations will be concerned with the assessment of cerebral dysfunction through the use of standard psychological tests. 3 units. Lecturer Thompson

245. Personality Theory I. An examination of representative theories of human functioning from Freud through depth and neoanalytic approaches. 3 units. Professor Alexander or Assistant Professor Kremen

246. Personality Theory II. An examination of representative models of human functioning from among such approaches as that of field theory, behavior theory, type or trait theory, and ego psychology. 3 units. Professor Alexander or Assistant Professor Kremen or Assistant Professor Schiffman

247-248. Personality Assessment. Introduction to the assessment of human personality through the study of personal documents, interview data, objective and projective test material. Laboratory sessions will be concerned with personality assessment of normal human subjects over extended time periods. 3 units each semester. Professor Alexander or Assistant Professor Kremen

249. Introduction to Exceptional Children. Survey course in special education covering the educational, psychological, medical, and social aspects of exceptional children. Field experiences including emotionally disturbed, mentally retarded, neurologically impaired, physically handicapped, crippling and special health conditions, socially and culturally deprived and gifted children. (Opportunities for attendance at psychiatric, psychological, and educational demonstrations with exceptional children.) 3 units. (Also listed as Education 249.) Lecturer Stedman

251. Personality and Person Perception. A review, analysis, and perspective of research and theory relevant to individual differences in attribution of psychological characteristics to other people. Discussion will highlight interactions among stimulus, situational, and personality variables. Special topics will include accuracy and differentiation in person perception, implicit personality theories, and the concept of projection. 3 units. Prerequisite: Permission of instructor. Associate Professor Altrocchi

253, 254. Personality Development. A survey of behaviors and con-

cepts relating to personality functioning through the life span from infancy to old age. Laboratory sessions will involve the study of individuals in natural and experimental contexts by observation and testing. 3 units each semester. Lecturer Eisdorfer and Associate Professor Borstelmann or Assistant Professor Singer

271 a-d. Seminar in Selected Problems. 3 units each.

273. Principles of Psychological Measurement. Psychological measurement will be discussed in the context of the theoretical questions which motivate research, and the related demands of scientific inference. Topics will include methods of psychometric scaling and test construction as well as selected methods for data analysis. Prerequisite: Mathematics 232 or

equivalent. 3 units. Associate Professor Schiffman

282. Introduction to Methods in Psychotherapy. Current trends in psychotherapeutic practice and research are discussed, as a means of introducing the student to the field. Emphasis is upon the application of principles drawn from theories of personality to individual and group psychotherapy. Discussions of selected readings and some field experience in therapy are included. 3 units. Associate Professors Lakin and Carson 292. The History of Psychology. 3 units. Professor Adams

For Graduates

305. Psychopathology. An examination of behavior disorders, with particular emphasis on explanatory concepts and the evidence from

research in this field. 3 units. Lecturer Cohen

306. Seminar in Developmental Psychology. Readings in Piaget, Lewin, McDougall, Adler and Freud in an effort to synthesize their insights into a coherent theory of personality structure and of the changes constituting development. 3 units. Professor Adams

309. Seminar in Learning. 3 units. Professor Kimble

310. Seminar in Perception. 3 units. Assistant Professor Lockhead

311. Seminar in Instrumental Behavior. 3 units. Professor Guttman

313. Seminar on Concept of the Reflex. A consideration of the reflexological principles found in the works of Sherrington, Sechenov, Pavlov, Eccles, Skinner, Konorski, et al., and an examination of the critiques of Goldstein, Lashley and others. Permission of instructors. 3 units. Professors Diamond and Guttman

316. Seminar in Social Psychology. 3 units. Professor Jones

318. Seminar in Social Influence. 3 units. Professor Brehm

320. Seminar in Community Mental Health. A study of psychological epidemiology and ecology; primary, secondary, and tertiary prevention; and the public health approach to problems of psychological disorders and psychological well-being. Focus on intervention techniques, such as consultation and community action planning. Prerequisite: Second year graduate level or permission of instructor. 3 units. Associate Professor Altrocchi

324. Seminar: Behavioral Studies of the Brain. 3 units. Professor

Diamond and Associate Professor Erickson

335-336. Clinical Psychology Practicum. Seminar discussion and supervised field experience in the application of basic psychological procedures and principles to clinical cases in a variety of institutional settings. Prerequisite: Psychology 245, 246, 247, and 248. 1 to 6 units each of two semesters. Staff

337. Seminar in Afferent Neural Processes. A study of the neural bases

of discrimination. 3 units. Associate Professor Erickson

341. Principles of Psychotherapy, I. Contributions from psychoanalysis, psychology, and social sciences will be reviewed to formulate a unified framework for understanding and treatment of behavior disorders. Emphasis on the problems characteristic of man living in society and culture and on principles of psychotherapy required by the human needs for consistency, self-esteem and self-realization. Selected case material will be used. Prerequisite: Psychology 282. 3 units. Professor Dai

342. Principles of Psychotherapy, II. Application of principles of psychotherapy in a detailed examination of interviews conducted by students. Emphasis on the role of the therapist's personality in the therapy process and on problems of technique. Prerequisite: Psychology 341. 3

inits. Professor Dai

343, 344. Advanced Seminar in Clinical Psychology. 1 to 3 units each

semester. Staff

371. Pre-School Behavior Problems. The diagnostic evaluation of behavior development in infants and preschool children. The nature and causation of developmental anomalies. (Physical handicaps and social conditions in relation to intellectual and personality development.) Preventive and remedial measures. 3 units. Associate Professor Banham

Religion

Professor Beach, *Director of Graduate Studies* (209 Divinity School); Professors Clark, Cushman, Davies, Henry, Lacy, Petry, Poteat, Price, Stinespring; Associate Professors Baker, Grislis, Herzog, Hillerbrand, Langford, Osborn, Smith, Sullivan, Wintermute; Assistant Professors Robinson and Tucker

The Department of Religion offers graduate work leading to the A.M. and Ph.D. degrees. Students may major in one of three fields: (1) Biblical Studies; (2) Historical Studies; and (3) Systematic and Contemporary Studies. They will be expected to take such courses in one or both of the other fields as will conduce to an adequate understanding of their chosen fields of specialization.

In addition to course work in these major fields, students will take such

other courses in cognate fields as will contribute to the enrichment of

their major studies.

This minor requirement may be fulfilled either by work in a cognate department, such as Classical Studies, History, or Political Science, or by work in a cognate field within the Department of Religion other than the field of major concentration.

The program of doctoral studies presumes a grounding in religion such as is normally derived from the course content of theoretical subjects of a seminary curriculum. Candidates for admission to the doctoral program are favored, therefore, who hold a B.D. degree from an accredited seminary or who have had at least two years of seminary study beyond the B.A. degree. Students applying for graduate work in religion directly from an undergraduate program should have had a strong undergraduate major in religion, and will be accepted for the Ph.D. program only on the condition of satisfactory completion of the M.A. degree with the department.

Candidates for the Ph.D. degree must complete the language requirements in both French and German not later than the beginning of the second year of residence.

Field I. Biblical Studies

201-202. First Hebrew. The principles and structure of the Hebrew language with translation of selected Old Testament narratives. 6 units. Professor Stinespring

207. Second Hebrew. Historical Hebrew grammar with reading and exegesis of Old Testament prose (the Pentateuch and historical books in

alternate years). First semester. 3 units. Staff

208. Second Hebrew. Historical Hebrew grammar with reading and exegesis of Old Testament poetry (the Prophets and the Writings in alternate years). Second semester. 3 units. Staff

209. Biblical Theology. A study of the Old and New Testaments in

regard to their theological relationship. 3 units.

226. Exegesis of the Greek New Testament I. A. Mark and Matthew; B. Romans; C. Colossians and Ephesians. (N.T. 226 A, N.T. 226 B, and N.T. 226 C are separate courses, offered in different semesters.) 3 units. Professor Price or Associate Professor Smith

227. Exegesis of the Greek New Testament II. A. Luke-Acts; B. Galatians and I Corinthians; C. The Pastoral Epistles; D. The Apocalypse. (N.T. 227 A, N.T. 227 B, N.T. 227 C, N.T. 227 D are separate courses, offered in different semesters.) 3 units. Associate Professor Smith

228. The Theology of the Gospel and Epistles of John. A study of the origin of these writings; the provenance of their thought forms and symbolism; their influence on the early church; and contemporary significance. 3 units. Professor Price

- 301. The Theology of the Dead Sea Scrolls. A study of the religious ideas of the Scrolls in relation to the theology of the Old and New Testament. 3 units.
- 302. Studies in the Intertestamental Literature. Selected documents of the Apocrypha and Pseudepigrapha examined exegetically and theologically in their relation to Post-Exilic Judaism. Prerequisite: Permission of the instructor. 3 units.

304. Aramaic. A study of the Aramaic portions of the Old Testament, and selected passages from the Targums, Midrashes, and Talmuds. 3 units. *Professor Stinespring*

305. Third Hebrew. An interpretative study of late Hebrew prose, with readings from Chronicles, Ecclesiastes, and the Mishnah. 3 units. Professor Stinespring

306. Language and Literature of the Dead Sea Scrolls. A study in inter-

pretation. Prerequisite, a knowledge of Hebrew. 3 units.

307. Syriac. A study of the script and grammar, with readings from the Syriac New Testament and other early Christian documents. Some knowledge of Hebrew and Aramaic prerequisite. 3 units. *Professor Stinespring*

309. History of the Ancient Near East. A specialized study of the civilizations of Egypt, Palestine, Syria, and Mesopotamia in the light of

Biblical archaeology. 3 units. Professor Stinespring

310. Old Testament Prophecy. The prophetic movement in Israel with special emphasis on the theological standpoint of the prophets of the

eighth century B.C. 3 units. Assistant Professor Tucker

318. Textual Criticism of the New Testament. A study of the scientific recovery of the Greek text on which modern versions are based; manuscript discoveries; principles of textual criticism; practice in collating original manuscripts in the Duke collection. 3 units. Professor Clark

340-341. Seminar in the New Testament. Research and discussion on a selected problem in the Biblical field. 2 or 3 units. Professor Price or Associate Professor Smith

Field II. Historical Studies

234. The Theology of Thomas Aquinas. A systematic interpretation of the thought of Aquinas, with a major emphasis on his specifically theological formulations, drawing upon the Summa Theologica and other relevant sources. 3 units. Associate Professor Grislis

240. The Theology of Richard Hooker. An exposition of the writings of the systematic theologian of Anglicanism in the sixteenth century. 3 units.

Associate Professor Grislis

250. The Reformation of the 16th Century. History and Thought of European Christianity between 1517-1555. (Listed also as History 225.) 3 units. Associate Professor Hillerbrand

251. The Age of the Counter-Reformation. History and thought of European Christianity between 1555 and 1650. 3 units. Associate Professor Hillerbrand

252. Pietism, Deism, and Rationalism. History and thought of European Christianity between 1650-1800. 3 units. Associate Professor

Hillerbrand

260. Seminar: Wesley Studies. The lives and thought of John and Charles Wesley and their colleagues in relation to English culture and religion in the 18th century. 3 units. Associate Professor Baker

279. Religions of East Asia. A study of the major traditions of China and Japan with emphasis on the development and expansion of Buddhism.

3 units. Associate Professor Sullivan

280. The History of Religions. A study of the methodology of the history of religious, the nature of religious experience, and specific categories of religious phenomena. 3 units. Associate Professor Sullivan

285. Origins of Indian Civilization. A study of the main sources and traditions of the classical civilization of the Indian sub-continent, with particular attention to religious movements and institutions. (Also listed as History 285.) 3 units. Associate Professor Sullivan

296. Religion on the American Frontier. A study of the spread of evangelical Christianity as a theological and cultural phenomenon of the

American West. 3 units. Professor Henry

322. Nineteenth-Century European Theology. Protestant theology from

Kant to Herrman. 3 units. Associate Professor Herzog

331. The Social Message of the Early and Medieval Church. A study of the social teachings and contributions of the Christian Church prior to the Protestant Reformation. 3 units. Professor Petry

332. The Medieval Church. Outstanding characteristics of the Medieval Church, emphasizing theory, polity, institutions, sacraments, and worship.

3 units. Professor Petry

334. Church Reformers and Christian Unity. The work of such reformers as Marsilius of Padua, William of Ockham, Jean Gerson, Pierre d'Ailly, and Nicholas of Cusa in relation to ecclesiastical schism and the search for Christian unity through representative councils. 3 units. Professor Petry

336. Christian Mysticism in the Middle Ages. Source studies in historical perspective of such late medieval mystics as Bernard of Clairvaux, the Victorines, Ramon Lull, Meister Eckhart, Richard Rolle, Catherine of

Siena, and Nicholas of Cusa. 3 units. Professor Petry

337. The Theology of Martin Luther. A critical and comparative examination of Luther's thought. 3 units. Associate Professor Hiller-brand

338. The Theology of John Calvin. An exposition of the Institutes of the Christian Religion in relation to cognate documents. 3 units. Associate Professor Grislis

339. Left-Wing Movements of the Reformation. A survey of the history and theology of the "radical" Reformation. 3 units. Associate Professor Hillerbrand

387. Christian Ethics and Social Philosophy. Selected social philosophies from Locke to Sumner analyzed from the standpoint of Christian

ethics. 3 units. Professor Lacy

391. Historical Types of Christian Ethics I. A critical study of representative statements of Christian ethical theory, through the early Reformation. 3 units. Professor Beach

392. Historical Types of Christian Ethics II. A continuation of C.E. 391, from the Reformation through current Christian ethical theory. Pre-

requisite: C.E. 391. 3 units. Professor Beach

395. Christian Thought in Colonial America. Exposition of the main

currents in Protestant theology. 3 units. Professor Henry

396. Liberal Traditions in American Theology. A study of the main types of modern religious thought, beginning with the theology of the Enlightenment. 3 units. Professor Henry

Field III. Systematic and Contemporary Studies

210. Contemporary British Theology. A study of twentieth-century British Theology. Attention will be given to the Anglican, Free Church, and Scottish traditions. 3 units. Associate Professor Langford

230. The Meaning of Religious Language. An analysis of the credentials of some typical claims of theism in the light of theories of meaning in recent thought. 3 units. (Also listed as Philosophy 230.) Professor Potent

231. Seminar in Christianity and Contemporary Thought. Analytical reading and discussion of such critical cultural analysis as is found in the works of M. Polanyi, Arendt, Trilling, and others, with appraisal of the relevance for theological inquiry. 3 units. Associate Professor Poteat

292. Christian Ethics and International Relations. An examination of Christian attitudes toward such issues as war and peace, the rule of law, foreign aid, and human rights; and the Church's contribution to interna-

tional policies and institutions. 3 units. Professor Lacy

300. Systematic Theology. Method and structure of systematic theology, the doctrine of God, theological anthropology, and Christology. 3

units. Associate Professor Herzog

303. The New Hermeneutic and the Concept of History. A critical examination of key issues in present-day European systematic theology centered in the positions of Fuchs, Ebeling, Moltmann. Ott, and Pannenberg. 3 units. Associate Professor Herzog

320. Hegel and Schleiermacher. A study of two makers of modern

protestant thought. 3 units. Associate Professor Herzog

325. Philosophical Theology I. Main problems in the history of philo-

sophical theology from the pre-Socratics to Descartes. 3 units. Assistant Professor Robinson or Professor Cushman

326. Philosophical Theology II. Main problems of philosophical theology in the modern period. 3 units. Assistant Professor Robinson or Professor Cushman

328. Twentieth-Century European Theology. Critical examination of the thought of selected representative theologians. 3 units. Associate Professor Herzog

333. Seminar: Marxist Ideology and Christian Faith. Comparative study of Communist and Christian doctrines of man, society, sin, history,

ethics, and eschatology. 3 units. Professor Lacy

380. Existentialist Thought. An exploration of the interests and motifs of Existentialism in relation to modern philosophy and theology through an analysis of representative writings of Kierkegaard, Heidegger, Berdyaev, Marcel, and Sartre. 3 units. Professor Poteat

385. Religion in American Literature. A critical study of the meaning and value of religious motifs reflected in American literature. 3 units.

Professor Henry

386. Seminar: Theological Trends in the World Church. Contemporary currents of Christian thoughts as they affect resurgent non-Christian faiths, new formulations of a theology of mission, and ecumenical conversations. 3 units. *Professor Lacy*

389. Christian Ethics and Contemporary Culture. A study of the interaction between Christian thought and current secular social theory. 3

units. Professor Beach

390. Current Problems in Christian Ethical Theory. A critical study of dominant issues in Christian ethics, through an analysis of a variety of contemporary Christian treatments of such problems as love, justice, community, and vocation. 3 units. Professor Beach

394. Christianity and the State. The relation of the Christian theory of the State to political problems, with special consideration of the religious assumptions underlying democratic theory and practice and of the rela-

tionship of church to state. 3 units. Professor Beach

397. Contemporary American Theology. Critical appraisal of major

tendencies. 3 units. Professor Henry

398. Colloquium on the College and University Teaching of Religion. The theological issues of religion in higher education; a consideration of the curricular content of religion courses. Normally expected of Level III students in Fields I, II, and III in residence. *Professor Beach and Staff*

Romance Languages

Professor Fein, Chairman (205 Foreign Lang.); Associate Professor Cordle, Director of Graduate Studies (303 Foreign Lang.); Professors

Cherpack, Davis, Dow, Fowlie, Predmore, and Wardropper; Associate

Professors Grant, Herrero, Hull, Tetel, and Vincent

The Department of Romance Languages offers graduate work leading to the A.M. and Ph.D. degrees. In order to undertake graduate study in this Department, the student should normally have credit for four years of college courses in the chosen language, or 18 semester hours beyond the conventional two units offered at entrance to college. In addition to this minimum requirement, the student should have had one semester of review in composition and grammar.

It is recommended that candidates for the A.M. degree take a second

Romance language as the minor subject.

A candidate for the Ph.D. degree will be required to take some training in Romance linguistics, the amount to be determined by the Department upon consideration of the student's preparation in the field, and a course in the methods of literary scholarship.

French

209. Advanced Composition and Syntax. A detailed study of the morphological and syntactic structure of the French language; practice in writing various styles of French; vocabulary study. 3 units. Associate Professor Hull

210. French Phonetics. The phonemic structure of contemporary French. Sounds, intonation. Practice transcription. Remedial pronunciation drills. Readings on current phonological theory, especially as applied

to French. 3 units. Associate Professor Hull

213. French Literature of the Seventeenth Century. Its initial phase. Readings in the major literary works to the middle of the century. 3 units.

(1967-68) Professor Cherpack

214. French Literature of the Seventeenth Century. Its "classical" phase. Readings in the major literary works from the middle to the end of the century. 3 units. (Not 1967-68) Professor Cherpack

217. Mallarmé and Rimbaud. The symbolism and the formal elements in Mallarmé's poetry. The poetic theory and the psychic elements in

Rimbaud's poetry. 3 units. (1967-68) Professor Fowlie

219. Old French Literature. An introduction to the reading of Old French literary texts. 3 units. (1967-68) Associate Professor Vincent

- 221. The Nineteenth-Century French Novel. Its initial phase. The Romantic hero in conflict with society, with special emphasis on the works of Stendhal and Balzac. 3 units. (Not 1967-68) Associate Professor Grant
- 222. The Nineteenth-Century French Novel. Its continuation. The decline of the individual hero. Flaubert and Zola will receive intensive study. 3 units. (1967-68) Associate Professor Grant

223. French Literary Criticism. A history of critical theory in France

and a study of the major critics from the Renaissance to today. 3 units.

(Not 1967-68) Professor Fowlie

225, 226. From Renaissance to Baroque in French Literature of the Sixteenth Century. First semester: Literary prose. Readings from Jean Lemaire de Belges, Marguerite de Navarre, Rabelais, Montaigne, and others. Second semester: Poetry and theater. Readings from Marot, Sceve, Labé, Saint Gelais, the Pléiade, d'Aubigné, Sponde, Du Bartas, Garnier, and others. (1967-68) Associate Professor Tetel

228. French Poetry of the Twentieth Century. In the wake of symbolism: Valéry and Claudel; poetry as ritual; Péguy; Apollinaire and surrealist poetry; the contemporary movement: Michaux, Char, Saint-John

Perse. 3 units. (Not 1967-68) Professor Fowlie

233. Contemporary French Theater. A study of dramatic theory; the art of the leading directors; and the major texts of Claudel, Giraudoux, Anouilh, Sartre, Beckett, Ionesco, Genet, etc. 3 units. (Not 1967-68) Professor Fowlie

234. Proust. A study of A la recherche du temps perdu. The thematic structure and the aesthetics of the work. 3 units. (Not 1967-68) Pro-

fessor Fowlie

236. Baudelaire. A study of the poetry and the criticism of Baudelaire as contributing to the origins of modern art and literature. 3 units.

(1967-68) Professor Fowlie

241, 242. French Literature and Thought in the Age of Enlightenment. First semester: The new philosophy and its propagation. Lectures and discussions involving texts by Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and others. Second semester: The crisis in literary aesthetics. Readings, lectures, and discussions bearing on the clash between Classicism and new literary orientations. 6 units. (1967-68) Professor Cherpack

245. French Literature of the Twentieth Century. To 1935. Emphasis on Gide, Mauriac, and Malraux. 3 units. (1967-68) Associate Pro-

fessor Cordle

246. French Literature of the Twentieth Century. After 1935. Emphasis on Sartre, Camus, and the *nouveau roman*. 3 units. (Not 1967-68) Associate Professor Cordle

For Graduates

311, 312. French Seminar. Each semester one of the following topics will be selected for intensive treatment: (a) Studies in Sixteenth-Century Literature, (b) Studies in Eighteenth-Century Literature, (c) Studies in Nineteenth-Century Literature, (d) Studies in Seventeenth-Century French Literature, (e) Studies in Contemporary Literature. 3 units each semester. Professors Cherpack and Fowlie: Associate Professors Cordle, Grant, and Tetel

—. Graduate Reading Course. An intensive course in French to develop rapidly the ability to read French in several fields. Graduate students only. No credit.

Italian

For Seniors and Graduates

288. The Renaissance. Petrarch, Boccaccio, and Ariosto. 3 units. (1967-68) Associate Professor Tetel

Spanish

For Seniors and Graduates

251. The Origins of the Spanish Novel. A critical study, based on close readings and discussions, of selected examples of the principal genres of the early novel: the Amadis de Gaula, Diego de San Pedro's La cárcel de amor, the Abencerraje, the Lazarillo. Montemayor's Diana. 3 units.

(1967-68) Professor Wardropper

252. Spanish Lyric Poetry Before 1700. A critical study, based on close reading and discussion, of selected poems of the Middle Ages, Renaissance and Baroque. Special emphasis on the Razón de amor, la poesía de tipo tradicional, and Santillana; on Garcilaso, San Juan de la Cruz, Fray Luis de León, and Herrera; on Góngora and Quevedo. 3 units. (Not 1967-68)

Professor Wardropper

253. The Origins of the Spanish Theater. A study of the evolution of the Spanish theater from the Auto de los Reyes Magos (12th century) through the end of the 16th century. The idea of the theater as dramatic poetry will be stressed; close reading of texts by Gómez Manrique, Encina, Gil Vicente, Torres Naharro, Lope de Rueda, Juan de la Cueva. 3 units. (Not 1967-68) Professor Wardropper

255. Modern Latin-American Literature. The coming of age of Latin-American literature in the nineteenth and twentieth centuries, with particular attention to the Modernist movement. 3 units. (Not 1967-68)

Professor Fein

256. Contemporary Latin-American Literature. Trends in Latin-American literature after the Modernist movement. Analysis of significant works in various genres. 3 units. (Not 1967-68) Professor Fein

258. Old Spanish Literature. An introduction to the reading of Old

Spanish literary texts. 3 units. (1967-68) Professor Davis

259. Spanish Phonetics. A phonemic approach to the study of Spanish sounds. Remedial pronunciation drills with special emphasis on rhythm and intonation. Readings in current studies of phonology. 3 units. (1967-68) Professor Predmore

260. Advanced Composition and Syntax. Study of fundamental difficulties in the language; practice in writing idiomatic Spanish; exercises in free composition. For students who have a satisfactory command of Spanish grammar and fair conversational ability. 3 units. (Not 1967-68) Associate Professor Herrero

261. Nineteenth-Century Novel. A study of literary trends in the last half of the nineteenth century. Readings will be selected from the novels of Valera, Pereda, Galdós, Pardo, Barzán, Blasco Ibánez, and their con-

temporaries. 3 units. (Not 1967-68) Professor Davis

262. Romanticism in Spain. A study of its origin and evolution from its earliest manifestations in the eighteenth century to Bécquer, with special attention to poetry and drama. 3 units. (1967-68) Associate Professor Herrero.

265. Golden Age Literature: Cervantes. The life and works of Cervantes with special emphasis on his Quijote. 3 units. (1967-68) Pro-

fessors Predmore and Wardropper

266. Golden Age Literature: The Drama. Study of the chief Spanish dramatists of the seventeenth century with readings of representative plays of this period. 3 units. (Not 1967-68) Professor Wardropper

275. Contemporary Spanish Literature. The essay and lyric poetry. A study of the revision of national values and literary expression in the twentieth century with particular reference to the crisis of 1898 and to the enrichment of the Spanish tradition through extra-peninsular influences. 3 units. (1967-68) Professor Predmore, Associate Professor Herrero

276. Contemporary Spanish Literature. The novel. A study of tradition and innovation in the twentieth-century Spanish novel with emphasis on the novels of Unamuno, Baroja, Valle Inclán, and Pérez de Ayala. 3 units.

(1967-68) Professor Predmore, Associate Professor Herrero

For Graduates

321, 322. Hispanic Seminar. Each semester one of the following topics will be selected for intensive treatment: (a) The Spanish Language in America, (b) Studies in Medieval Literature, (c) Studies in the Literature of the Golden Age, (d) Studies in Latin American Literature, (e) Studies in the Spanish Renaissance and Baroque, (f) Studies in Spanish Poetry, (g) Studies in Nineteenth-Century Spanish Literature. 3 units each semester. Professors Davis, Fein, Predmore, and Wardropper; Associate Professor Herrero

Romance Languages

211. Approaches to Romance Literature. An introduction to the most significant ways in which Romance literature has been divided and studied, with analyses of selected texts. 3 units. Professor Cherpack

218. The Teaching of Romance Languages. Evaluation of objectives

and methods; a study of the practical problems involved in teaching these languages on the elementary, secondary, and college levels; analysis of textbooks, special foreign language programs, audio-visual aids; critical examination of modern techniques in written and oral testing. 3 units. *Professor Dow*

224. Romance Linguistics. The origin and development of the Romance languages from spoken Latin to the modern standard languages and local dialects. Introduction to contemporary methods in historical and comparative linguistics. 3 units. (1967-68)

Associate Professor Hull

Slavic Languages and Literatures

Associate Professors Jezierski and Krynski

No graduate degree is presently offered in Slavic Languages and Literatures. The following courses may serve in the minor programs of

students in other departments.

201, 202. The Novelisis of Nineteenth-Century Russia. Development of the Russian novel against the European background, with emphasis on Dostoevskij and Tolstoj. Extensive readings in English. Lectures, oral reports, class discussions, and term paper. 6 units. Associate Professor Krynski

208. Soviet Literature and Culture. Literature since 1917, as a continuation of nineteenth-century traditions and as a response to Soviet ideology. Readings (in English or Russian) from major works of prose, poetry and

drama. 3 units. (w) Associate Professor Jezierski

212. Pushkin. A survey of his life and works, with attention given to his role as a precursor of modern Russian Literature. Prerequisite: Russian 101, or the instructor's consent. Readings in English or Russian. 3

sem. hours. (w) Associate Professor Jezierski

224. The Russian Short Story—18th Century to the Present. Readings of stories by such masters of the genre as Pushkin, Gogol, Turgenev, Tolstoy, Dostoevsky, Leskov, Chekhov, Gorky, Bunin, Andreyev, Babel, Zamiatin, Zoshchenko and Kazakov. Readings in English. Majors will do part of the reading in Russian. 3 units. Associate Professor Krynski

227. Gogol. A survey of his life and works, including his short stories, dramas and the novel. Readings will be in English, but students knowing Russian will do part of the reading in that language. Term papers and

class discussions. 3 units. Associate Professor Jezierski

230. Chekhov. Chekhov as a short story writer and his influence on the 20th Century Western short story. Close structural analysis of the plays of one of the greatest dramatists of all time. 3 units. Associate Professor Krynski

232. Fyodor Dostoevsky. A close examination of the major fiction of a leading 19th Century Russian writer whose craft and ideas remain a

living influence in much of contemporary Western literature. 3 units.

Associate Professor Krynski

233. Ivan Turgenev. The novels, short stories and drama of the great exponent of classical realism who was the first Russian writer to win fame in the West. 3 units. Associate Professor Krynski

236. Russian and Polish Romanticism. Prose, poetry, drama of such major writers as Pushkin, Lermontov, Mickiewicz and Krasinski presented against the background of the Romantic movement in Western Europe.

3 units. Associate Professor Krynski

Slavic 204. Polish Literature of the 20th Century. Readings in English of Polish novels, plays and poems, from the beginning of the century through the sixties. Emphasis on the avant-garde works of the liberal period after 1955. 3 units. Associate Professor Krynski

Sociology and Anthropology

Professor McKinney, Chairman (268 Sociology-Psychology Building); Professor Kerckhoff, Director of Graduate Studies (336 Sociology-Psychology Building); Professors Back, La Barre, Maddox, and Thompson; Associate Professors Beidelman, Buettner-Janusch, McCormack, Marsh, Preiss, Rowe, Roy, Smith, Tiryakian, and Winsborough; Assistant Professors Farley and Prost; Lecturer Apte

The Department offers graduate work leading to the A.M. and Ph.D. degrees in Sociology and in Anthropology. Before undertaking advanced work in this department, a student must have completed a minimum of twelve semester hours of approved preliminary courses in his chosen discipline, and twelve additional semester hours in the field or in related work. Applicants for admission should submit scores on the Graduate

Record Examination, especially the Aptitude Test.

Before being admitted to candidacy for the Ph.D. degree in Sociology, an applicant is normally expected to have qualified for the A.M. degree. Candidates for the Ph.D. degree are expected to demonstrate in qualifying and preliminary examinations a broad background in the various aspects of sociology—substantive, theoretical, and empirical. The program of each candidate is determined by a committee which reviews his previous work and sets the specific requirements to be met. These requirements will include work in related fields such as anthropology, economics, mathematics, philosophy, political science, or psychology. Emphasis is placed on the completion of the dissertation, directed by ε member of the staff, demonstrating competence and independence in the investigation of an original and significant problem.

Before being admitted to candidacy for the Ph.D. degree in Anthropology, an applicant is normally expected to have qualified for the A.M. degree. Candidates for the Ph.D. degree must show evidence by prelimi-

nary or qualifying examination a command of a major field within the discipline. The Department recognizes the trend in modern Anthropology toward interdisciplinary research and part of the Anthropology course requirements may be replaced by advanced work in anatomy, economics, sociology, zoology, and other disciplines relevant to the student's program.

Further details of these programs, the departmental facilities, the staff, and various stipends available are described in a brochure which may be obtained from the Director of Graduate Studies, Department of Sociology

and Anthropology.

Sociology

For Seniors and Graduates

241. Social Stratification. The nature of hierarchical and vertical differentiation in the economic, political and prestige structures in modern societies. The interrelationship of class, status and power strata and their influence on social institutions, personality structure, and group and individual behavior. 3 units. Associate Professors Marsh and Roy

242. The Sociology of Occupations and Professions. The social significance of work. Analysis of forces changing the contemporary occupational structure, typical career patterns of professions and occupations, the social organization of occupational groups. 3 units. Professor Mc-

Kinney and Associate Professor Roy

243. Population Dynamics and Social Change. The aim of this course is to introduce the student to the facts and techniques of demographic analysis, and to provide an understanding of the relationship between the demographic structure of society and its social organization. 3 units.

Associate Professor Winsborough

247. Community and Society. This course seeks to provide a frame of reference for the analysis and ordering of facts pertaining to the diverse cultures of the world, the State, the world community, the Great Society, news, mass behavior, social problems, races and classes. 3 units. *Professor Thompson*

251. The Sociology of Modernization. Changes, obstacles to change, and structural strains which occur in kinship, stratification, bureaucracy and the role of the military, occupations and work, communications, values and ideologies, during modernization. Special reference to Asian

societies. 3 units. Associate Professor Marsh

253. Social Institutions. The study of particular institutions and the social movements out of which they developed, with emphasis on the development of general propositions concerning the nature, function and importance of institutions in society. 3 units. Professor Thompson

255. Race and Culture. A comparative study of race relations in world perspective developed around such themes as races and personal identity, the geography and ecology of race relations, the idea of race, and race

conflict. 3 units. Professor Thompson

259. Religion and Social Change. A study of the role of religion in significant social changes in Western and non-Western societies. Emphasis given to non-institutional phenomena (charisma, prophecy, messianism, revivals, glossolalia). Prerequisite: either Anthropology 264, Sociology 151, or the equivalent. 3 units. Associate Professor Tiryakian

272. The Socialization Process. A consideration of the universal societal requirement for replacement of socialized personnel with major concentration on the process in Western society. Particular attention is given to variations in socialization by position in the social structure (class, caste, urban-rural, etc.) and to the contributions made by various socialization agencies (family, school, peer groups, mass media). 3 units. Professor Kerckhoff

275. Social Attitudes and Individual Behavior. Such issues as the following are considered: the importance of symbolic interaction, the development of the "self," the social structuring of the socialization process, individual movement within the social structure, and the importance of membership groups and reference groups. 3 units. *Professor*

Back and Kerckhoff

278. Social Structure and the Life Cycle. A study of the relationship between age as a social characteristic and social interaction, with particular reference to adolescence and old age. 3 units. Professor Maddox

282. Principles of Sociological Analysis. An advanced course in general sociology designed to give a systematic conception of social order, focusing on its structural components and the functions they serve. Undergraduates must have at least 15 s.h. and a B average in sociology and have the

permission of the instructor. 3 units. Professor Thompson

295. Methodology in Sociology. Considerations of the nature of scientific method, as well as alternative paths to knowledge, as they apply to sociology. Conceptualization, hypothesis formation, and definition. The research process as a decision-making situation both on the general level of research design and the specific level of special techniques. The process and logic of data analysis. Relations of theory and research are stressed. 3 units. Professor Back and Associate Professor Smith

297. Statistical Analysis in Sociology. Such techniques as zero and higher order linear and curvilinear correlation, partial correlation, analysis of variance and covariance and factorial design are studied. Where possible, analogous non-parametric techniques are also considered. Prerequisite: Mathematics 233 or an equivalent course or permission of the instructor. 3 units. Associate Professor Winsborough and Assistant Pro-

fessor Farley

For Graduates

325. Social Aspects of Mental Illness and Treatment. An examination and critique of sociological research and theory in the epidemiology,

etiology and treatment of mental illness. Such topics as the effect of mental illness on the family, the structure and function of various treatment systems, and major problems of methodology will receive emphasis. 3 units. Associate Professor Preiss

341. Special Problems of Complex Systems.

(a) Industrial and Professional Systems. Analysis of problems of organization of work in such diverse settings as industrial plants, hospitals, and public administration groups. Problems of decision-making, recruitment, allocation of authority, informal organization, interorganizational relations. 3 units. Professor McKinney and Associate Professor Roy

(b) Mass Communications. Theoretical problems in defining and distinguishing communication, communicative acts, communication processes, and communication systems. Work aimed toward the derivation of models and theories for each of these will be pursued. Students must have

permission of the instructor. 3 units. Associate Professor Smith

(c) Urban Society. Analysis is made of the varying mechanisms through which urban society is integrated, how urbanites develop a sense of identification with the community, and the extent and mode of social dominance of the city in the larger society. 3 units. Professor Thompson and Associate Professor Smith

(d) Human Ecology. An examination of such issues as: the logic and utility of the ecological approach; the possibility of testing current ecological theories in non-western, non-urban environment; alternative explanations for the spatial patterning of social phenomena; selected methodological problems. 3 units. Professor Thompson and Associate Professors Smith and Winsborough

351, 352. Seminar in Social Organization. Examination of such problems as the bases of social cohesion and continuity, the sources and effectiveness of social control mechanisms, the problem of social change in structural-functional theory. 3 units each semester. Professor Maddox,

McKinney, and Thompson

361. Seminar in Comparative Sociology. Student research projects on some aspects of cross-societal comparative analysis. Major emphasis on the relevance of evolutionary, functional, and structural theories for explaining the findings of comparative studies. 3 units. Associate Professor Marsh

373, 374. Social Psychological Issues in Sociology. Detailed exploration of selected problem areas such as the theory and measurement of social attitudes, role discontinuity and personality disorders, applications of reference group theory, the socialization process. 3 units each semester. Professors Back and Kerckhoff and Associate Professor Preiss

381. Development of Sociological Theory. An analysis of the development, convergence and utilization of sociological theory. 3 units. Pro-

fessor McKinney and Associate Professors Marsh and Tiryakian

385, 386. Seminar in Sociological Theory. Detailed analysis of methodological and substantive problems in utilizing comprehensive, middlerange, and discrete theories in varied sociological areas. Major emphasis on the use of theory in empirical research. Open to students who have had Sociology 381 or its equivalent. 3 units each semester. Professor McKinney and Associate Professors Marsh and Tiryakian

392. Individual Research in Sociology. Students will conduct on an individual basis research designed to evaluate a sociological hypothesis of their choice. The process must be completed by preparation of a report on this research in adequate professional style. Prerequisite: Sociology 295 or permission of the instructor. 3 units. Professors Back

and Kerckhoff and Associate Professor Smith

397, 398. Seminar in Special Research Problems. Treatment in depth of either selected methodological issues and/or methods. Examples of possible topics include scaling, methods of machine data processing, validation and induction, quantification, interviewing, measurement, sampling plans, development of research designs from statistical models, methodological research, experimental techniques, the relation of theory to research, and the role of statistical methods in sociology. Open to students by permission of the instructor. 3 units each semester. Professor Back and Associate Professors Smith and Winsborough

Anthropology

For Seniors and Graduates

220. Society and Culture in India. The basic features of Indian cultures and societies from an anthropological perspective. The impact of selected technological and social changes upon the individual, caste, and com-

munity. 3 units. Associate Professors Rowe and McCormack

222. Topics in African Anthropology. Current research problems in African anthropology, as illustrated by an intensive and continuing study of a tribal society. Interpretation of the results of field research in terms of contemporary theories about culture and society. 3 units. Associate Professor Beidelman

- 231. Physical Anthropology. A survey of the major developments of physical anthropology. Human evolution, primate phylogeny, paleontology of man and other primates, primate biochemical genetics, primate behavior, human variation (genetic and somatic) are the principal topics of the course. (Also listed as Anatomy M231.) 3 units. Associate Professor Buettner-Janusch
- 238. Language and Society. An introduction to the study of language and society. Universal features of language, language as a mirror of society and social perception through language, language as a coding

system, linguistics and anthropology, applied linguistics. 3 units. As-

sociate Professor McCormack and Lecturer Apte

249. Economic Anthropology. The study of economic organization and behavior in preliterate, peasant and transitional societies. Problems in the analysis of ownership and distribution. The relationship of economic processes to norms and institutions such as markets. 3 units. Associate Professor Rowe

260. Linguistic Anthropology: Phonemics. Application of descriptive linguistics to analysis of language; concentration on the sound system of a South Asian language, and other non-Western languages. 3 units.

Lecturer Apte

261. Linguistic Anthropology: Morphology and Syntax. Application of descriptive linguistics to analysis of language; concentration on the grammatical system of a South Asian language, and other non-Western languages. Prerequisite: Anthropology 260. 3 units. Lecturer Apte

262. Anthropology of Law. An introduction to the study of legal anthropology. Legal decision in preliterate societies. The interrelationships of law, ritual, and myth as viewed in recent studies of tribal societies. 3

units. Associate Professor Beidelman

263. Primitive Art and Music. A comparative ethnological study of the data and theories concerning non-European music and art; sufficient technical background will be provided for non-specialist students. Recordings, slides, and museum artifacts will be used. 3 units. Professor La Barre

264. Primitive Religion. The ethnography, the social functions, and the socio-psychological meanings of religion in primitive societies. 3 units.

Professor La Barre

265. Personality and Society. The sociology and social psychology of human personality, its origins in the primary group, its nature and varieties and its integrations into secondary group institutions. 3 units. Professor La Barre

266. Personality and Culture. The influence of culture patterns and social institutions upon character structure, socialization of the individual, and the dynamics of human personality. Comprehensive anthropological

materials will be drawn upon. 3 units. Professor La Barre

276. Analysis of Kinship Systems. A study of primitive relationship categories and the ways in which they are related to legal norms, ritual and social groupings. Theoretical issues and contrasting approaches to the analysis of social classification terminologies. 3 units. Associate Professor McCormack

291, 292. Anthropological Theory. An introduction to theoretical, methodological and comparative issues in anthropology. Emphasis on critical reading and review of monographs in social, cultural and psychological anthropology. 3 units each semester. Associate Professors

Beidelman and Rowe

For Graduates

330. Seminar in Anthropology. A seminar for advanced students who wish to pursue individual studies in social and cultural anthropology. Offered both semesters. 1 to 3 units each semester. Professor La Barre and Associate Professors Beidelman, McCormack and Rowe

393. Individual Research in Anthropology. A course for the student preparing the M.A. thesis or the Ph.D. dissertation. Supervision and guidance of intensive research or a problem approved by the enrollee's departmental advisory committee. 3 units. Professor La Barre and Associate Professors Beidelman, McCormack and Rowe

410. Seminar in the Government, History, and Social Structure of India and Pakistan. 3 units. Associate Professors McCormack, Rowe and

Associates

Zoology

Professor Horn, Chairman (227 Biological Sciences Building); Associate Professor Nicklas, Director of Graduate Studies (042 Biological Sciences Building); Professors Bailey, Bookhout, Fluke, Gray, Gregg, Hughes-Schrader, Livingstone, Menzies, Schmidt-Nielsen, Wilbur; Adjunct Professor Stefansson; Associate Professors Buettner-Janusch, Costlow, Hunter, Klopfer, Tucker, Vernberg, Wainwright, and Ward; Assistant Professor Vogel

To undertake study toward an advanced degree in zoology, a student should have completed an undergraduate major in zoology or its equivalent. This normally amounts to 24 or more hours of course work distributed among various fields of zoology. Most entering students will have had organic chemistry, calculus, and a year of physics. The department recognizes the trend in modern biology towards interdisciplinary research and part of the zoology requirments may be replaced by advanced work in chemistry, mathematics, physics, psychology, etc.

Required work for the A.M. degree ordinarily includes 12 units of advanced course work in zoology, 6 units of course work in a minor department, and an additional 6 units of advanced work in the major or minor department, or in other pertinent departments. Furthermore, an acceptable thesis is necessary for the fulfillment of the degree require-

ments.

Candidates for the Ph.D. degree are expected to be broadly trained zoologists. The program of each candidate is determined by a committee which reviews previous training and sets the specific requirements to be made. Normally the program includes graduate courses in several fields of zoology, courses in the minor subject, wide reading in science in general and in biology in particular, research, and a dissertation based on original work. Minor work is available in many fields, including anatomy, bio-

chemistry, botany, chemistry, geology, physics, physiology and psychology.

For Seniors and Graduates

201. Animal Behavior. A review of the major developments in the field with emphasis on recent physiological and developmental studies. Prerequisites: Physiology, Genetics and Evolution, or consent of instructor. 3 units; 4 units with laboratory. (1967-68) Associate Professor Klopfer

203. Ecology. Relation of animals to environment. Lectures, reading, reports, conferences; laboratory and field work. 4 units. (See also Marine

Laboratory.) Professor Gray

210. Experimental Genetics. The relation of phenotype to genome and environment; cytogenetics, recent research in the field of genetics. Laboratory. Prerequisite: Consent of instructor. 4 units. Associate

Professor Ward

214. Biological Oceanography. Composition in time and space of marine biosphere in relation to descriptive marine chemistry, physics, and geology. Some work at sea aboard the research vessel. Prerequisites: A course in Invertebrate Zoology, Ecology, Marine Biology or an appropriate equivalent. Chemistry through organic. One year of Physics and Mathematics. 4 units. (Given at Beaufort.) Professor Menzies

215. General Physical and Chemical Oceanography. Relief of the ocean floor; physical and chemical properties of sea water; distribution of temperature, salinity, and density; heat budget; sea ice; light; ocean currents, waves and tides; selected topics of regional oceanography.—Field work, processing and analyzing of routine oceanographical data, solving problems and interpretation of results. Prerequisites: One year of physics and chemistry, mathematics through calculus. 6 units. (Given at Beaufort) Adjunct Professor Stefansson

216. Limnology. The chemistry, physics and biology of lakes with special references to the interpretation of their sedimentary record. 3 units; 4 units with laboratory. (Not 1967-68) Professor Livingstone

218. Oceanographic Techniques. Theoretical and practical experience at sea aboard R/V Eastward in the use of equipment, facilities and data for oceanographic research. Limited to 12 students. 2 units. (Given at Beaufort) Professor Menzies

222. Entomology. Anatomy, physiology, embryology, and classification of insects. Prerequisite: one year of zoology. 4 units.* Professor Gray

224. Vertebrate Zoology. A study of life histories, adaptations, ecology, and classification of vertebrate animals. Prerequisite: Zoology 53. 4 units. (1967-68) Professor Bailey

228. Experimental Embryology. Lectures, readings, reports, and lab-

oratory work. 4 units. (1967-68) Professor Gregg

232. Human Genetics. Particular emphasis upon the uniqueness of studies in human genetics, human biochemical genetics, human popula-

tion genetics. Prerequisite: Anatomy 231 (Zoology 131) or an elementary course in biology including genetics, or permission of the instructor. 3 units. Associate Professor Buettner-Janusch

238. Systematic Zoology. The fundamental theory and practice involved in the collection, identification, and classification of animals. Prerequisite:

Biology 1-2. 4 units. (Not 1967-68) Professor Bailey

243. Cytology. The structural and functional organization of cells. Lectures, readings and laboratory work. Prerequisite: One year of biology. (Listed also as Botany 243.) 4 units. Professor Anderson (Botany) and Associate Professor Nicklas

244. Topics in Cell Structure and Function. Advanced discussions of selected problems such as chromosome structure, mitosis, and cytological aspects of inheritance and development. Prerequisite: Zoology 243 (Botany 243) or equivalent and permission of instructor. 2 units. (1967-68) Professor Moses (Anatomy) and Associate Professor Nicklas

245. Radiation Biology. Actions of ionizing and excitational radiations on life processes: a survey and an adventure in biophysics. Prerequisites: college physics and mathematics, organic chemistry. 3 units, or 4 units

with laboratory. Professor Fluke

246. Physical Biology. Physical principles of structure and function in large biological molecules and aggregates, applications to function at higher levels of organization, and to biological fitness. Prerequisites: Mathematics 22, Chemistry 151, Physics 41, and one and one-half years of college biology or consent of the instructors. 4 units. Professor Fluke and Associate Professor Wainwright

247. Biological Nucleonics. Fundamentals of nucleonics; instruction in biological uses of radioactive tracers, in counting instruments and measurements, and in legal requirements. Prerequisites: Consent of the instructor and one year each of college biology, chemistry, and physics. (Listed also as Forestry 247.) 3 units. (Not 1967-68) Professors

Fluke and Woods (Forestry)

250. Physiological Ecology of Marine Animals. A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla from various habitats are studied. Prerequisite: A course in physiology. 6 units. (Given at Beaufort.) Associate Professor Vernberg

252. Comparative Physiology. The physiological mechanisms of animals studied on a comparative basis. Prerequisite: Zoology 151 or

equivalent. 4 units. Professor Schmidt-Nielsen

271. Cellular Physiology. The physiological processes of living matter approached through studies of cells. Prerequisites: two years of biology

and at least one year of chemistry. 4 units. Professor Wilbur

274. Invertebrate Zoology. A study of structure, functions, and habits of invertebrate animals under normal and experimental conditions. Field trips will be made to study, collect, and classify animals in their natural

habitats. Prerequisites: Biology 1-2. 6 units. (Given at Beaufort.) Staff

278. Invertebrate Embryology. Lectures, readings, and laboratory work dealing with rearing, development, and life history of invertebrates. Prerequisite: Zoology 92. 4 units.* Professor Bookhout

For Graduates

351, 352. Departmental Seminar. A weekly meeting of graduate students and faculty to hear reports and to discuss biological facts, theories, and problems. One hour a week throughout the year. 1 unit credit by

arrangement. All Members of the Graduate Staff

353, 354. Research. Students who have had proper training may carry on research under direction of members of the staff in the following fields: (A) Embryology, (B) Physiology, (C) Cytology, Histology, (D) Invertebrate Zoology, (E) Ecology, (F) Morphology, (G) Parasitology, (H) Vertebrate Zoology, (I) Limnology, (J) Entomology, (K) Genetics, (L) Biophysics, (M) Animal Behavior, (N) Systematics, (O) Oceanography. Hours and credits to be arranged. All Members of the Graduate Staff

355, 356. Seminar. One or more seminar courses in particular fields are given each semester by various members of the staff. These will be in the

field indicated under courses 353-354 above. 2 units.

Marine Laboratory. The following courses will be given at Duke University Marine Laboratory, Beaufort, N. C., during the summer of 1967: 203, Marine Ecology; 215, General Physical and Chemical Oceanography; 250, Physiological Ecology of Marine Animals; 274, Marine Invertebrate Zoology. Students with the proper training may register for 353 and 354, Research in Zoology.

Master's Degree for Students Specializing in Physical Therapy

Students specializing in physical therapy may request admission to the Graduate School and if admitted follow the curriculum for the Master of Arts degree of either the Anatomy or Physiology Department. Selected physical therapy subjects are integrated with the graduate courses the first year. A thesis and the remaining physical therapy courses and practicum may be completed the second year. Upon satisfactory completion of the requirements a Master of Arts degree and a Certificate in Physical Therapy will be awarded. For information concerning the Physical Therapy Program write Miss Helen Kaiser, Director, Physical Therapy Department, Box 3247, Duke University Medical Center.

Advanced Degrees Conferred June 6, 1966

Master of Arts

Ai, Nguyen Huu Au, Shu Fun Balash, Albert John Balentine, Emily Whaley Bergstrom, Robert Francis Berry, Martha Sue Black, William Priestley Blair, Harry Wallace, II Bowers, Lucy Wynne Bradford, William C., Jr. Breckenridge, George Bryan Breit, Frederick Joseph Brown, Sandra Lou Bryan, Judith Mayers Burger, Francis Joseph Bushell, Alan Warren Bushoven, Cornelius, III Carmichael, Richard Dudley Chronaki, Bessie Clapp, Alice Windle Tyler Clarke, Jeffrey Johnstone Collier, Thomas Watts Collins, Alva Leroy, Jr. Coulbourn, Mildred Elizabeth Cunningham, Ruth D. Darroch, Arthur Gordon Lynn Donathan, Carl Dale Douglas, Donna Jean Garrison, Karl Claudius, Jr. Garry, Grace Mary Gearhart, Sara Alice George, Allaire Ann Goodrich, Karen Kruse Goodrich, Wendel Eugene Gramley, Stephan Edward Haire, Koleen Alice

Hansen, Richard Erling Harp, N. Gail Jabbour, Alan Albert Jones, John Leitch Kawakubo, Keisuke Kiely, Marguerite Marie Kiltinen, Hilma Pauline Fenton Lohman, William John, Jr. Luternauer, John Leland McFadden, Robert Holland Miyake, Akiko Moseley, Nellie Laurie Moughrabi, Fouad Mohammed Nelson, Charles Jay Neubauer, Richard John Nickerson, Nancy Stiles Ohara, Setsuko Page, Kaaren Kupfer Palmer, Dave Richard Papachristou, Gerald C. Parker, Henry Lewis Pitcher, John Harold Joseph Quinby, Dennis Powell Reed, Leonard F. B., Jr. Ross, John Ray Ryland, Robert Shane Sale, Thomas Sanderson Sanders, Richard W. Scott, Mary Jackson Segre, Amelia Sherman, Michael John Shields, Jerry Ashburn Sloane, David Edward Edison Spight, Thomas McMahon Stone, John Arthur Taylor, Eric French

Tejasen, Panee Thomason, Michael Vincent Raphael Valdez, Gerardo Noe Van, Lindley Wyman West, Harry Carter Zobel, Donald Bruce

Master of Arts in Teaching

Anderson, Edith Willis Belcher, Mary Virginia Pearson, Nancy M. Sherwood, Toby Dena Levenson Spencer, Bobby C. Walker, Charles David

Master of Education

Black, Linda Kay Cracknell, William Henry, Jr. Edell, Francine Miriam Hobgood, Rebecca Beverly Lethander, Barbara S. McCaughan, Susan Boutwell Orenstein, Barbara Rita Penland, Arnold C., Jr. Resch, Marian Elizabeth Rinehart, Caryl Ann Rogers, David Price Rojahn, James Rittenhouse Saltz, Linda Egan

Master of Science

Biggers, Robert Price Brealey, John J. Edwards, Bobby Bryan Jessup, William Reid Joshi, Ramkrishna Lal Kao, David Teh-Yu Kester, Walter Allan Lee, Kwang-kiang Roe, Robert Bolling, Jr. Rothamel, William Joseph Shelor, Paul David

Master of Hospital Administration

Brown, Terry Allen Corley, William Edward Hocker, Jimmie Clarke Kennedy, Robert Louis Lamb, James Allen Mozolak, Steven John Peck, Richard Hyde Smith, Scott Douglas Stambaugh, Jeffrey Lynn Wagner, Gerald Wirth, Jr. Wagner, Henry Carrh, III Watters, Vernon Gregg, III

Doctor of Education

Appenzeller, Herbert Thomas (A.B., M.A., Wake Forest College). Education. Dissertation: "An Analysis Of Court Cases Pertaining To Tort Liability For Injuries Sustained In A Public School Program of Physical Education"

Betts, Leonidas Judd, Jr. (A.B., University of North Carolina; M.Ed. Duke University). Education. Dissertation: "George Frederick Holmes: A Critical Biography Of A Nineteenth Century Southern Educator"

Byrd, Laurie Lawson (A.B., Furman University; M.Ed., University of South Carolina). Education. Dissertation: "The Development of Supervision Of Instruction In North Carolina With Emphasis On State Efforts To Provide Local Supervision To Rural Elementary Schools, 1900-1937"

Caughey, Dale Wells (B.S., M.S., Syracuse University). Education. Dissertation: "A Descriptive Study Of Business Managers In Certain Junior Colleges"

Corey, John Faris (A.B., M.A., Appalachian State Teachers College). Education.

Dissertation: "The Organization And Implementation Of A College Or Uni-

versity Public Affairs Program"

Dickens, Charles Henderson (B.S., M.Ed., Duke University). Education. Dissertation: "Effect Of In-Service Training In Elementary-School Mathematics On Teachers' Understanding And Teaching Of Mathematics"

Fischel, Sophie Harrison (B.S., M.A., East Carolina College). Education. Dissertation: "The Development Of Instructional Supervision In The Public Schools

Of North Carolina From 1938 To 1965"

- Hill, Fred William (A.B., Marion College; M.A., Appalachian State Teachers College). Education. Dissertation: "The Law And Pupil Transportation In North Carolina"
- Hudgins, Herbert Cornelius (A.B., High Point College; M.Ed., University of North Carolina). Education. Dissertation: "The Warren Court And The Public Schools"
- Latta, Everette Michael (B.S., M.A., Appalachian State Teachers College). *Education*. Dissertation: "The Development Of Pupil Transportation In The State Of North Carolina: 1908-1964"

Martin, Walter Travis, Jr. (B.S., M.A., East Carolina College). Education. Dissertation: "Fundamentals Learning Laboratories In Industrial Education Centers,

Technical Institutes And Community Colleges In North Carolina"

McGuire, George Morris (A.B., Hampden-Sydney; M.A., Montclair State College).

Education. Dissertation: "A Study Of School Administrative Unit Consolidation In North Carolina And Its Effect On Curriculum And Instruction In Selected Counties With Recommendations For Buncombe County"

Winstead, Elton Dewitt (B.S., Atlantic Christian College; M.Ed., Duke University). Education. Dissertation: "The Development Of Law Pertaining To Desegrega-

tion Of Public Schools In North Carolina"

Winstead, Philip Connor, Jr. (A.B., Davidson College; M.A., Appalachian State Teachers College). Education. Dissertation: "A Study Of The Responsibilities Of The Secondary School Principal In Instructional Supervision In North Carolina"

Doctor of Philosophy

Abert, James Goodear (B.S., University of South Carolina). *Economics*. Dissertation: "The Coordination Of Economic Policy In The Netherlands"

Andrews, Michael Cameron (A.B., Dartmouth College; M.A., Harvard University).

English. Dissertation: "Sidney's Arcadia On The English Stage: A Study Of The Dramatic Adaptations Of The Countess Of Pembroke's Arcadia"

Ayo, Nicholas Richard (A.B., M.A., Notre Dame; S.T.L., Gregorian University).

English. Dissertation: "Robinson And The Bible"

- Balta, Yalman I. (B.S., North Carolina State University; M.A., Duke University). Chemistry. Dissertation: "Crystallite Orientation In Polyethylene Terephtahalate"
- Barnett, Neal Mason (B.S., Purdue University). Botany. Dissertation: "Amino Acid And Protein Synthesis In Bermuda Grass During Water Stress"
- Bartell, Clelmer Kay (B.S., Davidson College). Zoology. Dissertation: "Characterization Of Two Melanophorotropic Hormones By Electron Radiation And Electrophoresis"
- Baxter, John Edwards, Jr. (B.S., Millsaps College; M.S., Vanderbilt University). Chemistry. Dissertation: "Nuclear Magnetic Resonance Measurements Of Potential Barriers In Some Acid Amides In Solution"
- Blakeley, Brian Layton (B.S., Wisconsin State College; M.A., Duke University). *History*. Dissertation: "The Colonial Office: 1870-1890"

Blanquet, Richard Steven (B.S., City College of New York). Zoology. Dissertation: "The Acontia Nematocysts Of The Sea Anemone Aiptasia Pallida: Mechanism Of Discharge And Toxin"

Boghosian, Charles (B.S., University of New Hampshire). Physics. Dissertation:

"Thermal Expansion In Quantum Liquids"

Boliek, John Ernest (B.S., University of Michigan; M.A., Duke University). Chemistry. Dissertation: "Novel Cyclizations Of Pyridine Derivatives"

Borcherding, Thomas Earl (A.B., University of Cincinnati). Economics. Dissertation: "The Growth Of Non-Federal Employment In The United States, 1900-1963"

Bradshaw, Ralph Alden (A.B., Colby College). Biochemistry. Dissertation: "I. Studies On The Structure Of Fumarase. II. Preparation And Properties Of The

Mixed Disulfide Of Lysozyme And Cystine"

Brown, Louise Stephens (A.B., Columbia College; M.A., University of South Carolina). English. Dissertation: "The Portrayal Of Spanish Characters In Selected Plays Of The Elizabethan And Jacobean Eras: 1585-1625"

Brown, William Jackson (A.B., M.A., University of North Carolina). English. Dissertation: "From Persepolis To Cyprus: The Disintegration Of The Self-

Contained Military Hero In Marlowe And Shakespeare"

Calder, William Alexander, Jr. (B.S., University of Georgia; M.S., Washington State University). Zoology. Dissertation: "Temperature Regulations And Respiration In The Roadrunner And The Pigeon"

Campbell, Joseph Gordon (A.B., Vanderbilt University; B.D., McCormick Seminary).

Religion. Dissertation: "The Concept Of Authority: An Analysis"

Chant, John Fulton (A.B., University of British Columbia). Economics. Dissertation: "The Effectiveness Of Monetary Policy And The London Clearing Banks: 1951-58"

Chapman, John Wehrley (B.S., Southwestern University). Physics. Dissertation: "Three Pion Production By 1.5 Bev/ C_{π} On Protons"

Chu, Limin (A.B., National Central University; M.A., Duke University). English. Dissertation: "The Images Of China And The Chinese In The Overland Monthly 1868-1883, 1883-1935"

Clayton, Bruce Lynn (A.B., Kansas City University; M.A., Duke University). History. Dissertation: "Southern Critics Of The New South, 1890-1914"

Danielsen, Albert Leroy (B.S., Clemson College). Economics. Dissertation: "Education And Economic Growth In The Philippines"

Douwaji, Ghazi (B.A., American University of Beirut). Economics. Dissertation:

"The Tunisian Economy"
Dozeman, Alvin (A.B., M.A., Michigan State University). Political Science. Dissertation: "The Republican Party In Guilford County, North Carolina, 1960-1964"

Driscoll, Charles Peter (A.B., Colgate University; M.A., Duke University). Chemistry. Dissertation: "Polarographic Study Of The Ioding-Iodide System At A

Rotating Platinum Electrode"

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Dunn, John Joseph (A.B., Harvard College; M.A., Duke University). English. Dissertation: "The Role Of Macpherson's Ossian In The Development Of British

Romanticism"

Edmondson, Clifton Earl (A.B., Mississippi College; M.A., Duke University). History. Dissertation: "The Heimwehr And Austrian Politics, 1918-1934"

El-Kamash, Magdi Mohamed (B.S., M.C., Cairo University). Economics. Dissertation: "An Analysis Of The Process Of Development Of The Egyptian Economy With Special Reference To The Supply Approach To Economic Development" Ellis, Robert Lee (A.B., Miami University of Ohio). *Mathematics*. Dissertation:

"Topological Vector Spaces Over Non-Archimedean Fields"

Eybers, Ian Heinrich (A.B., B.D., M.A., University of Pretoria; M.Th., Theological Seminary at Stellenbosch). *Religion*. Dissertation: "Historical Evidence On The Canon Of The Old Testament With Special Reference To The Qumran Sect"

Fernandez, Alejandro M. (A.B., University of the Philippines; M.A., Cornell University). *Political Science*. Dissertation: "International Law In Philippine

Relations, 1898-1946"

Gay, Lloyd Wesley (B.S., Colorado State University; M.F., Duke University).

Forestry. Dissertation: "The Radiant Energy Balance Of Pine Plantation"

Gillespie, Edgar Bryan (A.B., Wake Forest College; M.A., Duke University). English. Dissertation: "Paradise Regain'd: A History Of The Criticism And An Interpretation"

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1945"

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Haider, Syed Mohammad (A.B., M.A., Aligarh University; M.A., Duke University).

*Political Science. Dissertation: "Judicial Review Of Administrative Discretion"

In Pakistan"

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Investment-Reserve System And The Temporary Investment Tax"

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Durable Minority Party Gains In Selected States Since 1944"

Jones, Leonidas John, II (B.S., M.S., Duke University). *Electrical Engineering*. Dissertation: "Superconductive Threshold Logic Circuitry"

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tion: "Thiazolo (2,3-b) Thiazolium And Analogous Cations"

Jordan, James Daniel, Jr. (A.B., Furman University; B.S., Southeastern Seminary).

Religion. Dissertation: "The Church Reform Principles In The Biblical Works Of Jacques Lefevre D'Etaples"

Kaas, John Howard (A.B., Northland College), *Psychology*. Dissertation: "The Role Of Auditory Cortex In Selective Listening To One Ear"

Kauvar, Gerald Bluestone (A.B., M.A., University of Colorado). English. Dissertation: "Figurative Relationships In The Poetry Of Keats"

Kerbow, Dewey Lynn (A.B., Rice University; M.A., Duke University). Chemistru. Dissertation: "Fluorescence And Polarographic Study Of Some Benzoquinolizinium Compounds"

Kernaghan, Kenneth William David (A.B., McMaster University; M.A., Duke University). Political Science. Dissertation: "Freedom Of Religion In The Province Of Quebec With Particular Reference To The Jews, Jehovah's Witnesses And

Church-State Relations, 1930-1960"

Khalaf, Nadia (A.B., American University; M.A., Duke University). Political Science. Dissertation: "British Policy Regarding The Administration Of The Northern Sudan, 1899-1951"

Kirk, Paul Wheeler, Jr. (B.S., University of Richmond). Botany. Dissertation: "Morphogenesis And Microscopic Cytochemistry Of Marine Pyrenomycete

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Knipling, Edward Bryon (B.S., Vrginia Polytechnic Institute; M.A., Duke University). Botany. Dissertation: "Comparison Of The Dye Method With The Thermocouple Psychrometer For Measuring Leaf Water Potentials"

Kowal, Norman Edward (A.B., Washington Square College; M.A., Duke University). Botany. Dissertation: "Shifting Cultivation, Fire, And Pine Forest In The

Cordillera Central, Luzon"

Lacambra, Jose Maria (A.B., Gettysburg College). Physics. Dissertation: "A Study Of Mg²⁷ With (d,p-γ) Angular Correlations Measurements"

- Langlois, Alphonse Joseph (A.B., University of New Hampshire; M.A., Duke University). Microbiology. Dissertation: "Quantity Production Of Bai Strain A Avian Tumor Virus In Vitro"
- Lentricchia, Frank Richard (A.B., Utica College; M.A., Duke University). English. Dissertation: "The Poetics Of Will: Wallace Stevens, W. B. Yeats, And The Theoretic Inheritance"
- Lewis, Granville Douglas (B.S., University of Tennessee; B.D., Vanderbilt University). Religion. Dissertation: "Psychotherapeutic Concepts And Theological Categories: Some Problems In The Thought Of Carl Rogers And Paul Tillich"

Manning, Peter Kirby (A.B., Willamette University; M.A., Duke University).

Sociology. Dissertation: "Occupational Types And Organized Medicine:

Physicians' Attitude Toward The American Medical Association"

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Mathews, Jane DeHart (A.B., M.A., Duke University). History. Dissertation: "Art, Relief And Politics: The Federal Theatre, 1935-39"

McDaniel, William Maurice (A.B., Wofford College; B.D., Harvard University). Religion. Dissertation: "The Concept Of Progress In Recent Old Testament Research: 1878-1964"

McGee, Daniel Bennett (B.S., Furman University; B.D., Th.M., Southeastern Seminary). Religion. Dissertation: "The Meaning Of History And Political

Ethics In The Thought Of Herbert Butterfield"

Meekison, John Peter (A.B., B.A.Sc., M.A., University of British Columbia). Political Science. Dissertation: "Mental Health Administration In The United States With Special Reference To North Carolina"

Miller, Lee Norman (A.B., Southern Methodist University; M.F., Yale University).

Forestry. Dissertation: "Effects Of Water Stress During Chronic Ionizing

Radiation On The Growth Of Pine Seedlings"

Miller, Mary Ruth (A.B., Florida State University; M.A., George Peabody College). English. Dissertation: "The Crimean War In British Periodical Literature, 1854-1859"

Millholland, Donald William (A.B., Duke University; B.D., Union Theological Seminary). Religion. Dissertation: "Beyond Nihilism: A Study Of The Thought Of Michael Polanyi And Albert Camus"

Moore, L. E. (B.S., Oklahoma University). Physiology. Dissertation: "Anion Permeability In Frog Skeletal Muscle"

Morin, Bernard Arthur (B.S., Holy Cross; M.B.A., Harvard University). Economics. Dissertation: "Liquor Consumption And Prices, By State, 1963"

Oppel, Bernard Francis (A.B., Lehigh University; M.A., Duke University). History.

Dissertation: "Russo-German Relations: 1904-1906" Parkhurst, Michael Jerome (A.B., Boston University; M.A., Columbia University). Anatomy. Dissertation: "The Physiological Effects Of Prolonged Exposure To The Mus Norbegicus Albinus To An Oxygen Atmosphere At Reduced Pressure"

Purser, Fred Olthus, Jr. (B.S., United States Naval Academy). Physics. Dissertation: "Neutron Depolarization In Neutron Proton Scattering And Neutron

Polarization From The D(d,n) He³ Reaction"

Richardson, Robert Coleman (B.S., M.S., Virginia Polytechnic Institute). Physics. Dissertation: "Nuclear Magnetic Relaxation In Solid Helium Three"

Robinson, Robert Lewis (A.B., M.A., University of Alabama). History. Dissertation: "British Colonial Policy And Trade On The Windward Coast Of Africa, 1812-1832"

Rocks, James Engel (A.B., Western Reserve University; M.A., Duke University). English. Dissertation: "The Mind And Art Of Caroline Gordon"

Sawers, James Richard, Jr. (B.S., Duke University). Physics. Dissertation: "The Scattering Of 1.0- And 2.4MeV Polarized Neutrons From Helium"

Saylor, Ralph Gerald (A.B., Kalamazoo College). Economics. Dissertation: "The Economic System Of Sierra Leone With Special Reference To The Role Of The Government"

Schaffer, William Arthur (B.S., Georgia Institute of Technology). Economics. Dissertation: "Structural Changes And Plant Employment Proportions, 1954-57"

Sherer, James Pressly (A.B., Erskine College; M.A., Duke University). Chemistry. Dissertation: "I. Polyazonia Aromatic Systems. II. Base Reactions Of Acridizinium Salts. Opening And Closing Of The Ring"

Shirley, Emily Knapp (A.B., Vassar). Zoology. Dissertation: "Calcium And

Oxalate Metabolism In Neotoma And Other Rodents"

Shook, Howard Everett, Jr. (B.S., Mississippi State University; M.A., Duke University). Chemistry. Dissertation: "The Synthesis And Sterochemistry Of Monocyclic Phosphorus Compounds"

Skaggs, Merrill Maguire (A.B., Stetson University; M.A., Duke University). English. Dissertation: "The Plain-Folk Tradition In Southern Local-Color Fiction"

Slaughter, Frank Gill, Jr. (A.B., Harvard University). Mathematics. Dissertation: "Defining Systems And Metric Dimension"

Srygley, Fletcher Douglas (A.B., David Lipscomb College). Physics. Dissertation: "Electron Spin Resonance Studies Of Radiation Damage To Single Crystals Of

Ammonium Trifluoroacetate" Stanfiel, James Donald (A.B., Furman University). Psychology. Dissertation: "Jungian Typology, Neuroticism, And Field-Dependence"

Steensen, Donald Henry John (B.S., Iowa State College; M.F., Duke University). Forestry. Dissertation: "The Spatial Equilibrium Model Of The Wood-Supply Sheds For The Pulp and Paper Industry In Alabama"

Stephenson, Paul Bernard (A.B., M.S., Louisiana Polytechnic Institute). Physics. Dissertation: "Phosphorescent Studies Of 1, 2, 3, And 1, 2, 4 Trimethylbenzine And 1, 2, 3, 5 Tetramethylbenzine At Low Temperatures'

Tabony, Robert Henry (A.B., M.A., Rice Institute). Physics. Dissertation: "Optical Model Parameters From Average Total Neutron Cross Sections"

Taylor, Sylvia Earle (A.B., Florida State University; M.A., Duke University). Botany. Dissertation: "Phaeophyta Of The Eastern Gulf Of Mexico"

Terry, Robert Meredith (A.B., Randolph-Macon College). Romance Languages.

Dissertation: "Contemporary French Interrogative Structures"

Trotter, Agnes Anne (A.B., University of South Carolina; M.A., Duke University). History. Dissertation: "The Development Of Merchants Of Death Theory Of American Intervention In The First World War, 1914-1937"

Utley, Henry Griffith (A.B., Iowa University). Physiology. Dissertation: "I. Effects Of Actinomycin D And Thyromimetic Compounds On Mycardial And Hepatic Monamine Oxidase In The Rat. II. Effects Of Sulfhydryl Reagents On Peroxidation In Microsomes"

Ward, William Cornelius, Jr. (A.B., Johns Hopkins University). Psychology. Dissertation: "Creativity And Impulsivity In Kindergarten Children"

Wellons, Jesse Davis, III (B.S., M.F., Duke University). Forestry. Dissertation; "The Solution And Diffusion Of Water In Cellulose Derivatives"

Wright, Louis Edgar (B.S., Louisiana State University). Physics. Dissertation: "An Investigation Of The Nuclear Collective Model And The Scattering Of High

Energy Electrons From Partially Aligned Non-Sperical Nuclei"

Yarmat, Avrum Joseph (A.B., M.A., Roosevelt University). Psychology. Dissertation: "Conditioning Of The Galvanic Skin Response And Muscle Action Potentials In Humans As A Function Of The Conditioned Stimulus-Unconditioned Stimulus Interval"

Zimic, Lesley Francis (A.B., Radcliffe College; M.A., University of Miami). Romance Languages. Dissertation: "The Collective Protagonist In The Historical Novels Of Unamuno, Baroja, And Valle Inclan"

Advanced Degrees Conferred September 1, 1966

Master of Arts

Aiken, Susan Hardy Allen, Deborah Dawson Allwein, Joann Hershey Altman, Charles Frederick Bailey, John Clark Bieler, Steven H. Bromley, David G. Clapp, William Lee Dale, Stephen Wayne Eyssell, James Hugh Farthing, James David Fiore, James Fletcher, Frederick James Gay, Marina Bulgarin Gibbons, Linda Ruth

Hoque, Abu Nasar Shamsul

Howard, Kay Kerr, Robert Lansing Khan, Masihur Rahman Knauer, Ulrich Hermann Merrill, Sammy Ray Moreland, Laurence Wayne Packer, Pamelia Archer Roseberry, James Royal, III Schlichting, Cort Burk, Jr. Schneider, Joseph Leondar Simpson, John Gibb Smith, Donna Kay Trotter, George Jameson Weber, James King, Jr. Wellborn, Elizabeth Hood Wilkins, Joyce Flippin

Master of Arts in Teaching

Barnes, William Roy Beck, Charles Emil Benjamin, Lucinda Moore Bliss, John Richard Bohn, Joyce Fogle Brookes, David Walter Brooks, Anne Page Burnett, Mildred May Buzzard, Lynn Robert Clontz, Eva Pearce Crouch, Henry Leland, Jr. Davison, Harold Leroy Dickerson, Beverly Carol Drewes, Deanna Lynn Edwards, Louise Efird Evans, Janie Rebecca Ferguson, Lawrence Andrew Flowers, Rosabelle Hinton Frazier, Muriel Auman Freeman, William Hardin Fuller, Robin Byron Gaskins, Sidney Louis Goodwill, Patricia Jones Gregory, Cecile Elizabeth Hathaway, Amos Townsend Haworth, Richard Carlisle Henderson, Glenwood Carlton Howland, Joseph W. Hug, Anne Radford Phillips Hundt, Victor Karl Hynes, John Alden Jacoby, Arthur M. Jefferis, Franklin L. Johnson, John Palmer Johnson, Judith Lawson

Master of Education

Bryan, Dorothy Miller Carson, Anne Thornton Cunningham, Natalie Ingram Davis, James Thomas Draves, Rebecca Timmons Estes, Rebecca Stroud Helminger, Sammy Hodges Hibbs, Mary Watson Hollister, Patricia Hackett Howdle, David Arthur

Master of Science

Bumgardner, Larry Tyson Feng, Yun-Ming Frekko, Eugene Anthony

Jones, Patricia Inman Kilgore, Frank Judson King, Margaret Patridge Kurz, Barbara Ann Lamb, William Emerson Lane, Jo Ann D. Lascell, Sandra Kay Lobban, Sarah Elizabeth Long, Glenn Richard Martin, Lawrence Alfred Mastropaolo, Marie Phyllis Mata, Josie Ellen Moorefield, Jean Armstead Oliver, Sewall Kemble, III Palmer, Patricia Ann Greene Paull, Robert Charles Proctor, George Harmon, Jr. Revie, Charles Rea Rodning, Dennis Charles Rudisill, Barbara Stevenson Russell, Perry Glover Scarci, Nancy Eileen Shipway, Charles Morgan Singleton, David George Smyre, Elizabeth Anne Sorrell, Judy Stark, Beulah Ellen Swink, Nancy Thompson, Miles Howlett Tucker, Alice Cox Valentine, Jeffrey John Wefing, Barbara Langan Woodward, Elizabeth Cook Young, Alice Shirah Zipse, Sharon Ann

Howdle, Joan Irma Jamison, Celia Jeanne Mayes, Bertha L. Shook, Franklin Leo Stallings, Ann Coble Troyano, Margaret-Anne Wilson, Marshall Macon Woods, Elsa Ely Zells, Evette Joyce

Woods, John Oates, Jr. Wyatt, Robert Harris, Jr. Kim, Kun Ha

Doctor of Education

- Griffin, John Duncan (A.B., Mercer University; M.S., Auburn University; B.D., Southern Baptist Theological Seminary). Education. Dissertation: "North Carolina Elementary School Teachers' Understanding Of Contemporary Arithmetic"
- Hartung, Arthur Bruce (A.B., Catawba College; M.Ed., Duke University). Education. Dissertation: "A Study Of The Importance Of Certain Characteristics Of Teachers In The College-Parallel Divisions Of Junior Colleges In North Carolina And The Extent To Which These Characteristics Were Reported To Exist"

Doctor of Philosophy

- Barrier, Norman Gerald (A.B., M.A., Duke University). History. Dissertation: "Punjab Politics And The Disturbances Of 1907"
- Brown, James Armistead, Jr. (A.B., University of Mississippi). *Economics*. Dissertation: "Antitrust And Competiton In The Glass Container Industry"
- Brucker, Eric (A.B., University of Delaware). Economics. Dissertation: "Structural Changes In The North Carolina Banking Industry: 1950-1963"
- Buchanan, Rupert Archer (A.B., Bishops University; LL.B., University of British Columbia). *Philosophy*. Dissertation: "Wittgenstein's Discussion Of Sensations"
- Carr, William Edward Statter (B.S., Stetson University). Zoology. Dissertation: "Chemoreception In The Mud Snail, Nassarius Obsoletus"
- Crist, Buckley, Jr. (A.B., Williams College). Chemistry. Dissertation: "Water Proton Magnetic Relaxation Times Of Aqueous Solutions Of Copper (11) Complexes"
- Crossland, Peter Nelson (A.B., M.A., Miami University; B.S., Yale University).

 *Political Science. Dissertation: "A Critical Analysis And Reformulation Of The Democratic Theory Of Voting And Elections Contained In Several Contemporary Voting Studies"
- Crossley, Ronald Cooper (A.B., Howard College; B.D., Southern Baptist Seminary). Religion. Dissertation: "The Anachronism: Nineteenth-Century British Protestant Missionary Studies Of Hinduism"
- Davis, Frank Mark (A.B., Bryan College; M.A., University of Tennessee). English.

 Dissertation: "Herman Melville And The Nineteenth-Century Church Community"
- Foster, Bennett Bert (B.S., Colorado State University; M.F., Oregon State University). Forestry. Dissertation: "Dynamic Production Paths And Labor Productivity Trends: A Comparative Study Of The Major Timber-Based Industries Of The South And The West Coast"
- Gill, Jerry Henry (A.B., Westmont College; M.A., University of Washington; S.T.B., New York Biblical Seminary). *Religion*. Dissertation: "Ian Ramsey's Interpretation Of Christian Language"
- Hamilton, Richard Edward (A.B., University of Toronto). Economics. Dissertation: "The Damodar Valley Corporation: India's Experiment With The T. V. A. Idea"
- Herndon, Jerry Allen (B.S., Murray State College; M.A., Duke University). English. Dissertation: "Social Comment In The Writings Of Joel Chandler Harris"
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- Jones, Donald Lee (A.B., Ohio Wesleyan University; B.D., Methodist Theology School). *Religion*. Dissertation: "The Christology Of The Missionary Speeches In The Acts Of The Apostles"
- Kerr, Marilyn Sue (A.B., Gettysburg College; M.A., Duke University). Zoology.

Dissertation: "A Lipoprotein In The Yolk And The Hemolymph Of The Female Blue Crab, Callinectes Sapidus Rathbun"

Klepper, Elizabeth Lee (A.B., Vanderbilt University; M.A., Duke University).

Botany. Dissertation: "Effects Of Salinity On Salt And Water Uptake By Corn Roots"

Lagos, Ricardo Froilan (A.B., University of Chile). *Economics*. Dissertation: "Industry In Chile: Some Structural Factors"

- Lovell, Charles Albert Knox (A.B., College of William and Mary). *Economics*. Dissertation: "A Comparison Of Statistical Properties Of Aggregate Production Functions"
- McElroy, John Harmon (A.B., Princeton University; M.A., Duke University).

 English. Dissertation: "Images Of The Seventeenth-Century Puritan In American Novels, 1823-1860"
- Miller, Arthur McA. (A.B., Princeton University). English. Dissertation: "The Last Man: A Study Of The Eschatological Theme In English Poetry And Fiction From 1806 Through 1839"
- Mount, Charles Eric, Jr. (A.B., Southwestern at Memphis; B.D., Union Theological Seminary; S.T.M., Yale University). *Religion*. Dissertation: "Conscience And Responsibility: A Study In Contemporary Christian Ethical Theory"
- Pelt, Michael Riley (A.B., Troy State College; B.D., Duke University). Religion.

 Dissertation: "Textual Variation In Relation To Theological Interpretation In The New Testament"
- Printz, Deborah Burnham (B.S., M.A., Duke University). Biochemistry. Dissertation: "A Study Of The Apparent Relationship Between Mistranslation And An Altered Leucyl-Trna Synthetase In A Conditional Lethal Mutant Of Neurospora Crassa"
- Simpson, John Evan (A.B., Amherst College). *Philosophy*. Dissertation: "Facts" Skaggs, Calvin Lee (A.B., Henderson State Teachers College; M.A., Duke University). *English*. Dissertation: "Narrative Point Of View In Edgar Allen Poe's Criticism And Fiction"
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- Sullivan Margaret Sue (A.B., Duke University; M.A., Auburn University). *English*. Dissertation: "Carson McCullers, 1917-1947: The Conversion Of Experience"
- Sydneysmith, Sam (B.A.Sc., M.A., University of British Columbia). *Economics*. Dissertation: "Economic Benefits And Market Areas For Outdoor Recreation: Some Theoretical Aspects"
- Tatum, Walter Barnes (A.B., Birmingham-Southern University; B.D., Duke University). Religion. Dissertation: "The Matthaean Infancy Stories. Their Form, Structure, and Relation To The Theology Of The First Evangelist"
- Tutt, Ralph Mandell, Jr. (A.B., M.A., Kent State University; M.A., Ohio State University). English. Dissertation: "Charles Lamb: Author In Search Of A Form"
- Upchurch, Norma (A.B., Wake Forest College; M.A., Emory University). Romance Languages. Dissertation: "The Theater Of Jean-Paul Sartre: Myth, Freedom And Commitment"
- Van, Thomas Anthony (A.B., City College of New York; M.A., Duke University). *English.* Dissertation: "A Critical Reading Of Chaucer's *Knight's Tale* With The Aid Of Boccaccio's *Teseida*"
- Vance, Robert Dale (A.B., Kenyon College). *Philosophy*. Dissertation: "Reference And Intentionality"
- Warnecke, Richard Basley (B.S., Cornell University; M.A., Colgate University).

 Sociology. Dissertation: "Dropouts From Collegiate Nursing: A Typological Study Of Role Conflict"

- Westin, Richard Barry (A.B., Grove City College; M.A., Duke University). History.

 Dissertation: "The State And Segregated Schools: Negro Public Education In North Carolina, 1863-1923"
- Wilkinson, James Burton (A.B., Davidson College). Mathematics. Dissertation: "Covering Dimension And Metric-Dependent Dimension Functions"

Fellows, Scholars, and Assistants

Angier Duke Memorial Fellow

Name Department Home Address
MacGarvie, Sherman Weston (B.S., Mount Allison University). Mathematics. Sackville, Canada

James B. Duke Fellows

Bergstrom, Robert F. (B.S., Loyola University; M.A., Duke University). *English*. Chicago, Illinois

Boutwell, Gordon P., Jr. (B.C.E., M.S.C.E., Georgia Institute of Technology). *Civil Engineering*. Baton Rouge, Louisiana

Buchanan, John George (A.B., Lehigh University; M.A., Roosevelt University). *History*. Chicago, Illinois

Crosby, Marshall R. (B.S., Duke University). Botany. Gainesville, Florida

Darroch, Arthur Gordon (A.B., University of Western Ontario; M.A., Duke University). Sociology. Middlesex, England

Dennis, Peter John (A.B., University of Adelaide). *History*. Adelaide, South Australia Foster, James Joseph (A.B., Johns Hopkins University). *English*. Baltimore, Maryland

Foy, Martha R. (A.B., Randolph-Macon Woman's College; M.A., Yale University). Romance Languages. Richmond, Virginia

Gasper, Louis C. (B.S., Duquesne University). *Economics*. Pittsburgh, Pennsylvania Gorbet, Frederick William (A.B., York University). *Economics*. Welland, Ontario, Canada

Grimes, Terrence Layne (A.B., Yale University). English. Altus, Oklahoma

Hakes, Jay Edward (A.B., Wheaton College). Political Science. Wheaton, Illinois Johnston, William R. (A.B., University of Sydney; LL.B., University of Queensland). History. Queensland, Australia

Knauer, Ulrich (Vordiplom, Free University of Berlin). Mathematics. Kulmbach, Germany

McCullers, Linwood A. (B.S.C.E., Duke University). Civil Engineering. Durham, North Carolina

Morrill, Richard L. (A.B., Brown University; B.D., Yale Divinity School). *Religion*. Hingham, Massachusetts

Myers, Samuel Maxwell, Jr. (B.S., Duke University). Physics. Olanta, South Carolina

- Olssen, Erik Newland (A.B., M.A., Otago University). *History*. Dunedin El, New Zealand
- Plehwe, Rudolph (A.B., University of Tasmania). *Political Science*. Kings Meadows, Australia
- Scott, Graham C. (M.Com., University of Canterbury). *Economics*. Christ Church, New Zealand
- Sewell, David O. (A.B., University of Canterbury). *Economics*. Wellington, New Zealand
- Therrien, Edward Francis (B.S., Syracuse University). Physiology. Irvington, New York
- Wagner, Carl G. (A.B., Princeton University). Mathematics. Basking Ridge, New Jersey
- Westmacott, Martin W. (A.B., University of Alberta; M.A., Carleton University). *Political Science*. Calgary, Alberta, Canada
- Wilbanks, Dana W. (A.B., Trinity University; B.D., Union Theological Seminary). Religion. New York, New York

Ottis Green Fellow

Gates, John Morgan (A.B., M.A., Stanford University). History. San Jose, California

Dempster Fellows

- Charlesworth, James H. (A.B., Ohio Wesleyan University; B.D., Duke University).

 Religion. Ponte Vedra Beach, Florida*
- Gravely, William Bernard (A.B., Wofford College; B.D., Drew University). Religion. Pickens, South Carolina

Gurney Harriss Kearns Fellows in Religion

- Goodman, William R., Jr. (A.B., Washington and Lee University; B.D., Union Theological Seminary). *Religion*. Lexington, Virginia
- Parrent, Allen Mitchell (A.B., Georgetown College; B.D., Vanderbilt University). Religion. Durham, North Carolina
- Wiley, David N. (A.B., College of Wooster; B.D., McCormick Theological Seminary). Religion. Cincinnati, Ohio

Commonwealth Center Fellows

- Cooper, Fraser Barry (A.B., University of British Columbia). Political Science. Vancouver, Canada
- Dendy, John O. (A.B., Royal Military College; M.A., Carleton University). History. Calgary Alta, Canada
- Fels, Allen Herbert Miller (B.S., University of Western Australia). Economics. Mosman, West Australia
- Kerton, Robert R. (B.C., University of Toronto; M.A., Carleton University). Economics. Ajax, Ontario, Canada
- Turner, Wesley B. (A.B., M.A., University of Toronto). History. Western Ontario, Canada

Woodrow Wilson Fellows

Bazemore, Connie Gayle (A.B., Wesleyan College). English. Fitzgerald, Georgia Bell, Albert Atwood, Jr. (A.B., Carson-Newman College). History. Roanoke, Virginia Cole, Frances Ann (A.B., College of William and Mary). English. Richmond, Virginia

Gilbert, William Henry (A.B., Washington and Lee University). English. Stony Creek, Virginia

Jackson, Jean Marie (A.B., Furman University). English. Fort Mill, South Carolina King, Herman Thomas (A.B., Old Dominion College). History. Virginia Beach, Virginia

Lein, Clayton David (A.B., Michigan State University). English. East Lansing,

Lucas, Sandra Ann (A.B., Stetson University). English. Coral Gables, Florida

Merrifield, Edward Francis (A.B., Wheeling College). History. Charleston, West Virginia

Rodgers, Sandra Kay (A.B., Furman University). Romance Languages. Greenville, South Carolina

White, Donald Glenn (A.B., Kentucky Southern College). History. Louisville, Kentucky

Duke Woodrow Wilson Fellows

Armistead, Jack M. (A.B., Michigan State University). English. East Lansing, Michigan

Clark, James William, Jr. (A.B., University of North Carolina). English. Vaughan, North Carolina

Cowgell, John Anthony (A.B., Bellarmine College). *Psychology*. Valley Station, Kentucky

Gifford, James F., Jr. (B.D., S.T.M., Andover Newton). History. Newton Center, Massachusetts

Jorgensen, Richard Stanley (A.B., Dana College). History. Des Moines, Iowa

Lambe, Dean Rodney (A.B., Whitman College). Psychology. Edmonds, Washington

Manley, Sharon J. (A.B., Bucknell University). Romance Languages. Ridgewood, New Jersey

Nelson, Paul David (A.B., Berea College). History. Spencer, Virginia

Pelham, Thomas G. (A.B., Florida State University). *Political Science*. Bonifay, Florida

Strong, Larry R. (A.B., Ball State University). German. Logansport, Indiana Sutherland, Robert W., Jr. (A.B., University of Texas). Political Science. Houston, Texas

Woodrow Wilson Dissertation Year Fellows

Nelson, Ronald R. (A.B., State University of South Dakota). *History*. Sioux Falls, South Dakota

Sieber, Harry C. (A.B., Baylor University). Romance Languages. San Bernardino, California

Cokesbury Awards in College Teaching

Beall, Larry G. (A.B., Harpur College; M.A., University of South Carolina). *Economics*. Due West, South Carolina

Haire, Koleen (A.B., M.A., Duke University). History. Tallahassee, Florida

National Science Foundation Cooperative Fellow

Seibel, Frederick T., Jr. (B.S., Yale University). Physics. Corning, New York

National Science Foundation Cooperative Fellow

Anderson, John T. (A.B., Hamilton College). *Mathematics*. Northport, New York Blackford, Susan K. (B.S., Tulane University). *Zoology*. St. Petersburg, Florida Fincher, Jean (A.B., Lake Forest College). *Zoology*. Midlothian, Illinois

Mantuani, Mary A. (A.B., Swarthmore College; M.A., University of Toronto).

Botany. Beverly, Massachusetts
Nelson, Roger W. (B.S., University of Rochester). Chemistry. Durham, North Caro-

Nelson, Roger W. (B.S., University of Rochester). Chemistry. Durham, North Carolina

Weatherspoon, Charles P. (B.S., University of Arizona). Forestry. Tucson, Arizona Williams, Frank C. (B.E.E., Georgia Institute of Technology; B.D., Southwestern Baptist Theological Seminary). Philosophy. Jackson, Mississippi

National Science Foundation Summer Teaching Assistants

Peek, Charles Wilbum, III (A.B., M.A., University of Georgia). Sociology. Cedartown, Georgia

Racine, Charles Henry (A.B., Dartmouth College). Botany. Hinsdale, Illinois Sherwin, Priscilla Anne (A.B., Pomona College). Botany. Arlington, Virginia Soltau, Susan Kae (B.S., Florida Presbyterian College). Zoology. Atlanta, Georgia

National Science Foundation Graduate Trainees

Barket, Thomas P. (A.B., Rockhurst College). Chemistry. Kansas City, Missouri Brodie, Benjamin T. (B.S.E.E., North Carolina State University). Electrical Engineering. Scotland Neck, North Carolina

Capowski, Joseph J. (B.S.E.E., Bucknell University). *Electrical Engineering*. Pitman, New Jersey

Collins, Jerry C. (B.E., Vanderbilt University; M.S.E.E., Purdue University). Electrical Engineering. West Lafayette, Indiana

Fasanella, Edwin L. (B.S., North Carolina State University). *Physics*. Roaring River, North Carolina

Hass, George M. (A.B., Northwestern University). Biochemistry. Lombard, Illinois Lane, Malcolm G. (B.S., Davidson College). Mathematics. Orlando, Florida

Lawless, Philip A. (A.B., Rice University). Physics. New Orleans, Louisiana

Levy, Stephen H. (A.B., Temple University). *Philosophy*. Philadelphia, Pennsylvania

Lufkin, Lance (A.B., University of South Carolina). Sociology. Durham, North Carolina

Lytle, Leslie T. (B.S., University of Cincinnati). Chemistry. Batavia, Ohio

McCord, Joe Milton (B.S., Southwestern at Memphis). Biochemistry. Memphis, Tennessee

Petersen, Richard Randolph (B.S., University of Washington). Zoology. Hoodsport, Washington

Piech, Jeffrey L. (A.B., Princeton University). *Mathematics*. Aiken, South Carolina Puzak, John C. (B.S., Carnegie Institute of Technology). *Chemistry*. Pittsburgh, Pennsylvania

Raiford, Maurice T. (B.S., Guilford College; M.A., College of William and Mary).

Physics. Greensboro, North Carolina

- Scott, Thomas R., Jr. (A.B., Princeton University). Psychology. Norwood, Pennsylvania
- Slepetz, John M. (B.C.E., M.C.E., University of Virginia). Civil Engineering. Durham, North Carolina
- Solomons, Suzanne (B.S., Brown University). Biochemistry. New London, Connecticut
- Webb, Geoffrey Roderick (A.B., University of South Florida). Mathematics. Tampa, Florida

National Aeronautics and Space Administration Fellows

Adams, Theodore C. (A.B., Earlham College; M.S., Wayne State University). Chemistry. Chicago, Illinois

Allen, Robert L. (B.S., Purdue University). Biochemistry. Indianapolis, Indiana Anderson, Thomas W. (A.B., Wesleyan University; M.A., Duke University). Phys-

iology. Hemet, CaliforniaArend, Lawrence E., Jr. (A.B., Stanford University). Psychology. Rapid City, South Dakota

Browne, John C. (B.S., Drexel Institute of Technology). *Physics*. Pottstown, Pennsylvania

Ellis, Olive A. (A.B., Rice University). Zoology. Durham, North Carolina

Farrier, David S. (B.S., Virginia Polytechnic Institute). Chemistry. Blacksburg, Virginia

Fruchtenict, David C. (B.S., University of California). Botany. Lakeport, California Geisfeld, Vinton (A.B., St. Olaf College). Mathematics. Vernon Center, Minnesota Hansen, John Frederick (A.B., Wisconsin State College). Chemistry. Turtle Neck, Wisconsin

Harrington, Jonathan E. (A.B., Harvard College; A.B., University of Cambridge). Zoology. Granville, New York

Harris, Victor A. (A.B., Brown University). *Psychology*. Mt. Vernon, New York Holland, Morris K. (A.B., University of Colorado). *Psychology*. Boulder, Colorado Hunt, Ann Hampton (A.B., University of North Carolina at Greensboro). *Chemistry*. Denton, North Carolina

Kilham, Peter (A.B., Dartmouth College). Zoology. Lyme, New Hampshire Krabill, James R. (A.B., Miami University). Mathematics. Bowling Green, Ohio

Krey, Lewis C. (A.B., Brown University). Physiology. Teaneck, New Jersey

Lane, Nancy M. (A.B., College of Notre Dame of Maryland). *Physiology*. Baltimore, Maryland

Loope, Lloyd L. (B.S., Virginia Polytechnic Institute). Botany. Bluemont, Virginia Michaels, Rebecca (B.S., Wake Forest College) Mathematics. Morganton, North Carolina

Miller, David E. (B.S., North Carolina State College). *Electrical Engineering*. Greensboro, North Carolina

Morgan, George L. (A.B., Rice University). Physics. Houston, Texas

Nichols, Joseph C. (A.B., Wesleyan University). Mathematics. Maplewood, New Jersey

Owsley, Norman Lee (B.S., Lehigh University; M.S., Duke University). *Electrical Engineering*. Wexford, Pennsylvania

Roxby, Robert W. (A.B., Gettysburg College; M.A., University of North Carolina). *Biochemistry*. Glenside, Pennsylvania

Sander, William A., III (B.S.E.E., Clemson College). Electrical Engineering. Charleston, South Carolina

Stone, John A. (B.S., Wofford College). Chemistry. Spartanburg, South Carolina

Teipel, John W. (A.B., Rockhurst College). Biochemistry. Kansas City, Missouri Tiedman, James S. (A.B., Drake University). Physics. Des Moines, Iowa Zobel, Donald B. (B.S., North Carolina State University; M.A., Duke University). Botany. Raleigh, North Carolina

National Defense Act Fellows, Title IV

Ashley, Lawrence R. (A.B., University of Chicago). Philosophy. Chicago, Illinois Atkinson, Gary M. (A.B., Holy Cross College). Philosophy. Dallas, Texas Barbour, Michael G. (B.S., Michigan State University). Botany. Lansing, Michigan Baxa, Ernest G., Jr. (B.E.E., University of Virginia). Electrical Engineering. Dan-

ville, Virginia

Beach, Stephen W. (A.B., Stanford University). Sociology. Kenosha, Wisconsin Bean, Frank D., Jr. (A.B., University of Kentucky; M.A., Duke University). Sociology. Lexington, Kentucky

Beck, Kirsten (A.B., Bucknell University). Philosophy. Washington, D. C.

Bishop, Charles W. (A.B., M.A., University of Missouri). English. Columbia. Missouri

Boggess, Samuel F. (B.S., University of Illinois). Biochemistry. Urbana, Illinois Brown, Thomas A. (A.B., St. Olaf College). History. Rochester, Minnesota Buehler, John N. (B.S., Wittenberg University). Psychology. Dover, Ohio

Bunker, Stephen G. (A.B., Harvard College). Sociology. Santa Fe, New Mexico Camp, Charles W. (A.B., University of Oregon). Sociology. Anderson, South Caro-

Campbell, Henry F. (B.S., University of Richmond). Chemistry. Edwardsville. Virginia

Carey, Douglas MacArthur (A.B., Johns Hopkins University). Romance Languages. Salisbury, Maryland

Casadonte, Paul P. (A.B., St. Peter's College). Romance Languages. Jersey City, New Jersey

Cassel, Thomas Z. (A.B., M.A., University of Miami). Philosophy. Miami, Florida Chapman, Carol A. (A.B., Pomona College). Economics. Whittier, California

Cole, Alexander B. (B.S., M.S., University of Missouri). Forestry. Athens, West

Collins, Daniel F. (A.B., Holy Cross College). Sociology. Belle Rose, New York Cook, Clayton B. (A.B., Rutgers University). Zoology. North Brunswick, New Jersey Corcoran, Paul E. (A.B., Princeton University). Political Science. Camden, Michigan Cornette, James A., Jr. (A.B., College of William and Mary). English. Newport News, Virginia

Dunn, Patrick P. (A.B., Marquette University). History. Cudahy, Wisconsin Dunning, William C. (B.S., Union College). Mathematics. Gloversville, New York Dutrow, George F. (B.S., M.F., Duke University). Forestry. Washington, D. C. Epifanio, Charles E. (A.B., Lafayette College). Zoology. Trenton, New Jersey

Epps, Thomas W. (A.B., Rice University). Economics. Katy, Texas

Fair, Richard B. (B.S., Duke University; M.S., Pennsylvania State University). Electrical Engineering. University Park, Pennsylvania

Falkenberg, Philippe R. (A.B., Queens University). Psychology. Kingston, Ontario, Canada

Fiola, Alice L. (A.B., M.A., University of Minnesota). Romance Languages. Duluth, Minnesota

Flanagan, Thomas E. (A.B., Notre Dame University). Political Science. Ottawa, Illinois

Forsythe, Stephen E. (B.S., Rollins College). Physics. Orlando, Florida

Fraley, Jonathan D., Jr. (A.B., University of North Carolina). History. Lenoir, North Carolina

Frasure, Robert C. (A.B., MA., West Virginia University). *Political Science*. Morgantown, West Virginia

Garrison, Karl C., Jr. (A.B., University of Georgia; M.A., Duke University; B.D., Episcopal Divinity School of Philadelphia). Sociology. Durham, North Carolina Garrity, Thomas F. (B.S., Holy Cross College). Sociology. Philadelphia, Pennsyl-

Goodrich, John W., II (A.B., University of Vermont). Mathematics. Burlington, Vermont

Gorman, Sara G. (A.B., Texas Christian University). English. Fort Worth, Texas Grimes, Virginia T. (A.B., Smith College). Romance Languages. Swampscott, Massachusetts

Hahn, Juergen S. (A.B., University of Michigan). Romance Languages. Ann Arbor, Michigan

Hamilton, James L. (A.B., Grinnell College). Economics. Bloomfield, Iowa

Harrah, Ivan C. (A.B., Wake Forest College). History. Fairmont, North Carolina Hayes, Betty C. (A.B., University of Alabama). English. Tuscaloosa, Alabama

Hecky, Robert E. (B.S., Kent State University). Zoology. Cuyahoga Falls, Ohio Hedlin, Myron W. (A.B., Gustavus Adolphus College). History. Lowry, Minnesota Heeney, Kenneth A. (A.B., St. Peter's College). Romance Languages. Jersey City, New Jersey

Helgerson, John L. (A.B., St. Olaf College). *Political Science*. Huron, South Dakota Henderson, Alfred J., Jr. (A.B., Wesleyan University). *Physics*. Jacksonville, Illinois Henrich, Joseph G. (A.B., LaSalle College; M.A., Lehigh University). *History*. Philadelphia, Pennsylvania

Hewitt, James M. (A.B., Princeton University). Mathematics. Concord, Massachusetts

Hoffman, Charles E. (A.B., Rice University). *Political Science*. North East, Pennsylvania

Honhart, Carol T. (A.B., Carleton College). English. Missoula, Montana Honhart, Michael W. (A.B., Carleton College). History. North Saint Paul, Minnesota

Hopkins, Edwin E. (A.B., University of Maryland). Philosophy. Baltimore, Maryland

Iversen, Karen M. (A.B., Queens College). Economics. Long Island City, New York Jones, David M. (A.B., Carleton College). Political Science. Thief River Falls, Minnesota

Jones, Russell A. (A.B., Georgia Institute of Technology). Psychology. Macon, Georgia

Jubien, Michael E. (A.B., Dartmouth College). Philosophy. Washington, D. C. Keane, Michael A. (A.B., Saint Peter's College). Romance Languages. Brooklyn, New York

Kepner, Larry A. (B.S., University of Illinois). Zoology. Tokyo, Japan Killackey, Herbert P. (A.B., University of California). Psychology. Los Angeles, California

Killion, Howard R. (A.B., Westmont College). History. Forest Falls, California Kulinski, Robert A. (A.B., St. Mary's College). History. Chicago, Illinois Lepak, Gary W. (A.B., Hamilton College). English. Brightwaters, New York Lind, Kenneth T. (A.B., University of Minnesota). Political Science. St. Paul Park, Minnesota

Lobb, Barry L. (B.S., Lafayette College). *Mathematics*. Bangov, Pennsylvania Lockwood, Lawrence, Jr. (A.B., Dartmouth College). *Romance Languages*. Virginia Beach, Virginia

- Long, Theodore E. (A.B., Capital University). Sociology. Austin, Texas
- McMillan, Janet A. (A.B., University of Arizona). Economics. Tucson, Arizona
- Maddox, Donald L. (A.B., University of Kansas). Romance Languages. Ozark, Missouri
- Maskall, Martha J. (A.B., Stanford University). Zoology. Rancho Cordova, California
- Matthews, John M. (A.B., Emory University). History, Marietta, Georgia
- Menge, Paul E. (A.B., St. Johns University; M.A., University of Minnesota).

 Political Science. Madison, Wisconsin
- Menning, Bruce W. (A.B., St. Johns University). *History*. Minneapolis, Minnesota Middleton, Charles R. (A.B., Florida State University). *History*. Tallahassee, Florida
- Moody, Walton S. (A.B., Princeton University). History. LaCrosse, Wisconsin
- Morrow, Lance F. (A.B., Florida Presbyterian College). History. Fort Myers, Florida
- Mosley, Hugh G. (A.B., M.A., Georgetown University). *Political Science*. Atlanta, Georgia
- Mowry, Fred L. (B.S., Syracuse University). Forestry. Syracuse, New York
- Murdock, Gordon R. (A.B., Reed College). Zoology. La Mesa, California
- Nelsen, Roger B. (A.B., DePauw University). Mathematics. Indianapolis, Indiana
- Nixon, Eileen M. (A.B., Swarthmore College). English. Madison, Ohio
- Owens, Rufus D. (A.B., East Carolina College). Chemistry. Greenville, North Carolina
- Patz, Frank P. (A.B., Bowling Green State University). Philosophy. Port Clinton, Ohio
- Perkins, Raymond K., Jr. (A.B., Colby College). *Philosophy*. Concord, New Hampshire
- Polacco, Joseph C. (B.S., Cornell University). Biochemistry. Brooklyn, New York Porter, James N. (B.S., Indiana State College; M.A., Duke University). Sociology. Pittsburgh, Pennsylvania
- Ragan, Charles E. (B.S., The Citadel). Physics. Albany, Georgia
- Robertson, James M. (A.B., Taylor University). English. Roanoke, Virginia
- Robinder, Ronald C. (A.B., Linfield College). Chemistry. Spokane, Washington
- Robinson, David E. (A.B., Hamilton College). English. Chagrin Falls, Ohio
- Rochow, Theodore F. (A.B., Dartmouth College; M.A., Duke University). Botany. Darien, Connecticut
- Rosenwald, John R. (A.B., M.A., University of Illinois). English. Western Springs, Illinois
- Rundel, Philip W. (A.B., Pomona College). Botany. Menlo Park, California
- Ruth, Robert D. (A.B., State University of New York). Sociology. Lockport, New York
- Sarkissian, Berge (B.S., Drexel Institute of Technology). *Physics*. Durham, North Carolina
- Schaeffer, Mary L. (A.B., Swarthmore College). Biochemistry. Setauket Long Island. New York
- Schneider, Philip A. (A.B., Cornell University). Philosophy. Durham, North Carolina
- Shatoff, Larry D. (A.B., State University of New York). Mathematics. Rochester, New York
- Sherman, Michael J. (A.B., University of Toronto). Sociology. Durham, North Carolina
- Simmons, William A. (A.B., Harvard University). English. Clinton, Connecticut Somers, Joseph H. (A.B., LaSalle College). Chemistry. Monroeville, Pennsylvania

Staffa, Nickolas G., Jr. (A.B., Johns Hopkins University). *Physics*. Baltimore, Maryland

Stokes, Randall G. (A.B., South Dakota State College). Sociology. Durham, North Carolina

Stouffer, Willard B. (A.B., Northwestern University; M.A., Miami University).

Political Science. Bloomfield Hills, Michigan

Sugar, Conrad E. (A.B., University of Illinois). English. Chicago, Illinois

Tatum, William T. (A.B., University of Mississippi). English. Meridian, Mississippi Taylor, John, Jr. (B.S., University of South Carolina). Physics. Columbia, South Carolina

Tobiessen, Peter L. (A.B., Wesleyan University; M.S., Pennsylvania State University). Botany. Berwyn, Pennsylvania

Vaughn, Garrett A. (A.B., Harpur College). Economics. Suffern, New York

Vidrine, Marshall R. (B.S., Louisiana State University). Philosophy. Denham Springs, Louisiana

Vines, John M. (A.B., College of the City of New York). Romance Languages. Staten Island, New York

Wallace, Barnie A. (B.S., Tulane University). Physics. Darlington, South Carolina
 Watson, George L. (A.B., Phillips University). Political Science. Enid, Oklahoma
 Weaver, Oliver L. (B.S., California Institute of Technology). Physics. Durham,
 North Carolina

Weaver, Theodore W., III (A.B., Carleton College; M.A., Montana State University).

Botany. Augusta, Kansas

Weidner, Peter R. (B.S., Albright College). *Mathematics*. Reading, Pennsylvania Wells, Daniel A. (A.B., Union College). *English*. Adams, Massachusetts

Wilbur, Frederick P. (A.B., University of Maine; M.A., Duke University). English. Rockland, Maine

Wildgen, John K. (A.B., Gonzaga University). Political Science. Seattle, Washington

Wildmon, Gary C. (A.B., Thiel College). Chemistry. Farmdale, Ohio

Wilson, Peter A. (A.B., Lafayette College). Philosophy. Buffalo, New York

Wilson, Wilkie A. (B.S.E.E., Louisiana State University). *Electrical Engineering*. Alexandria, Louisiana

Wood, James B. (B.S., University of Wisconsin). History. Durham, North Carolina Wright, George W. (B.S., Hampden-Sydney College). Chemistry. LaCrosse, Virginia

National Defense Act Fellows, Title VI

Breit, Frederick J. (A.B., Roosevelt University). *History*. Durham, North Carolina Calkins, R. A. (B.S., Ohio State University). *Economics*. Columbus, Ohio

Casey, Allen J., Jr. (A.B., M.A., Wake Forest College). History. Rocky Mount, North Carolina

Claus, P. J. (A.B., M.A., University of Wisconsin). Sociology. Marshall, Wisconsin Elder, Robert E. (A.B., Colgate University). Political Science. Hamilton, New York

Hahn, J. W. (A.B., University of Pennsylvania). *Political Science*. Philadelphia, Pennsylvania

Sykes, T. M. (A.B., University of Washington). *Political Science*. Everett, Washington

Tepper, Elliot L. (A.B., University of Michigan; M.A., American University).

Political Science. Midland, Michigan

Thursby, Gene R. (A.B., B.D., Oberlin College). Religion. Akron, Ohio

Danforth Fellows

Lein, Clayton (A.B., Michigan State University). English. East Lansing, Michigan

Marras, Ausonio (A.B., Colgate University). Philosophy. Ushers, New York

Spragens, Thomas A., Jr. (A.B., Wesleyan University). *Political Science*. Danville, Kentucky

Duke Apprentice Teaching Fellowships

Arfin, William (A.B., Brooklyn College; M.A., Duke University). English. New York, New York

Bedell, George C. (A.B., University of the South; B.D., Virginia Theological Seminary). *Religion*. Chapel Hill, North Carolina Bickley, R. Bruce, Jr. (A.B., University of Virginia; M.A., Duke University). *English*.

Anchorage, Kentucky

Crofts, Richard A. (A.B., Georgetown College; B.D., Southern Baptist Theological Seminary). *Religion*. Anchorage, Kentucky

Curry, Lawrence H., Jr. (B.S., M.A., University of South Carolina). History. Greenville, South Carolina

Garry, Grace M. (A.B., Sweet Briar College; M.A., Duke University). English. Taylor, Texas

Goodrich, W. Eugene (A.B., M.A., University of Alberta; M.A., Duke University). *History*. Alberta, Canada

Jabbour, Alan A. (A.B., University of Miami; M.A., Duke University). English. Jacksonville, Florida

Leutze, James R. (A.B., University of Maryland; M.A., University of Miami). History. Durham, North Carolina

Roetzel, Calvin J. (A.B., Hendrix College; B.D., Perkins School). Religion. Tulsa, Oklahoma

Taylor, Eric French (A.B., Bowdoin College; M.A., Duke University). English. Sauqus, Massachusetts

Williamsen, Thomas M. (B.S., Colorado State University). History. Denver, Colorado

Distinguished Teaching Fellows

Arpad, Joseph H. (A.B., University of California at Los Angeles; M.A., University of Iowa). English. Santa Anna, California
 Breckenridge, George (M.A., Glasgow University; M.A., Duke University). Political

Science. Dumbarton, Scotland

Goode, William O. (A.B., Washington and Lee University; M.A., Duke University). Romance Languages. Chase City, Virginia

Roth, Robert H. (A.B., Purdue University; M.A., Duke University). Sociology. Hagerstown, Indiana

Danforth Graduate Fellowship for Women

Ginter, Beverly Ann (A.B., M.A., Stanford University; M.L.S., University of California; A.B, University of London). *English*. Durham, North Carolina

Lilly Foundation Fellows and Scholars

Henry, Paul B. (A.B., Wheaton College). *Political Science*. Arlington, Virginia Schmid, Byron L. (A.B., Augsburg; B.D., Philadelphia Lutheran Seminary). *Political Science*. Braham, Minnesota

New York State Regents Fellowships

Gutman, Stanley T. (A.B., Hamilton College). English. Merrick, New York Brandstadter, Michael (A.B., Adelphi University). History. Flushing, New York

Southern Education Foundation Fellows

Allen, Jesse (B.S.C., North Carolina College at Durham; M.Ed., Duke University). Education. Durham, North Carolina

Nelson, Robert Allen (B.S., M.A., Appalachian State Teachers College). Education. Cliffside, North Carolina

Committee on International Studies Fellows

Duley, Margot I. (A.B., Memorial University of Newfoundland). *History*. St. John's, Newfoundland, Canada

Fels, Allen Herbert Miller (B.E., L.I.B., Western Australia). *Economics*. Mosman Park, Western Australia

Fenton, Charles Stephen (A.B., Hull University; M.A., McMasters University).

Sociology. Ontario, Canada

Oskam, Robert Theo (A.B., Dickinson College). *Political Science*. Burlington, New Jersey

Oyewole, Anthony (A.B., Duke University). *Political Science*. Modakeke-Ife, Nigeria

Pervan, Ralph F. (A.B., M.A., University of Western Australia). *Political Science*. South Perth, Western Australia

Polhemus, James H. (B.S., University of Tennessee; M.A., University of Virginia). Political Science. Mascot, Tennessee

Seldon, James Ralph (A.B., Carleton University). *Economics*. Ottawa, Ontario, Canada

South Asian Fellows

Berry, Willard M. (A.B., Pomona College; M.A., Duke University). *Political Science*. Whittier, California

Church, Roderick A. (A.B., University of British Columbia). *Political Science*. Richmond, Britsh Columbia, Canada

Reinhardt, William W. (A.B., M.A., Duke University). History. South Orange, New Jersey

Southern Studies Fellows

Gifford, James F., Jr. (B.D., S.T.M., Andover Newton). History. Newton Center, Massachusetts

Kincaid, Randall R., Jr. (A.B., Wofford College; M.A., Duke University). *Economics*. Quincy, Florida

McCrimmon, John Marshall (A.B., University of Illinois). Sociology. Harlan, Kentucky

University Fellows

Almers, Wolfhard (M.D., Freie Universitat Berlin). Physiology. Berlin, Germany

- Auld, Richard J. (A.B., North Carolina State University). Philosophy. Raleigh, North Carolina
- Butler, Keith W. (B.S.A., Ontario Agriculture College). *Physiology*. Oakville, Ontario, Canada
- Duley, Margot (A.B., Memorial University of Newfoundland). *History*. St. John's, Newfoundland
- Ebben, James A. (A.B., Holy Cross; M.A., Marquette University). *Philosophy*. Durham, North Carolina
- Eichler, Margrit E. (Diploma, Freie Universitat Berlin). Sociology. Walter Flexstr, Germany
- Fels, Allen Herbert Miller (B.E., L.I.B., Western Australia). *Economics*. Mosman Park, Australia
- Fenton, Charles Stephen (A.B., Hull University; M.A., McMasters University). Sociology. Ontario, Canada
- Finger, Homer E. (A.B., Davidson College). German. Nashville, Tennessee
- Granfield, Michael Edward (A.B., University of Illinois). Economics. Chicago, Illinois
- Haas, Richard Dexter (A.B., Kalamazoo College). Parchment, Michigan
- Ham, Donald Lee (A.B., William Jewell College). Forestry. East Peoria, Illinois
- Hilmy, Mehdi (B.Sc., M.Sc., Colorado State University). Physiology. Baghdad, Iraq
- Hoff, David C. (A.B., College of William and Mary). Philosophy. Durham, North Carolina
- Huber, Ronald L. (A.B., Capital University; B.D., Evangelical Lutheran Theological Seminary). Religion. New Albany, Ohio
- Jensen, Walter E., Jr. (A.B., University of Colorado; LL.B., M.B.A., University of Indiana). *Political Science*. Ft. Collins, Colorado
- Jewell, Christopher W. (A.B., Tufts University). Economics. Melrose, Massachusetts
- Kerton, Robert (B.C., University of Toronto; M.A., Carleton University). *Economics*. Ajax, Ontario, Canada
- Langdon, Bruce Earle (A.B., Brown University). Political Science. Grafton, Massachusetts
- Law, James (A.B., Lincoln University; M.A., New York University). Psychology. Charlotte, North Carolina
- Levy, Robert J. (A.B., M.A., Boston University). Philosophy. Bronxville, New York
- Lomranz, Jacob (A.B., Tel-Aviv University). *Psychology*. Tel-Aviv, Israel Meadows, John C. (B.S., Auburn University; M.S., Georgia Institute of Technology).
- Forestry. Vidalia, Georgia

 Mowbray, Robert Norman (A.B., University of Minnesota). Forestry. Duluth,
 - Minnesota

 A.B., University of Minnesota). Porestry. Dulutin
- Olivier, Thomas Joseph (B.S., Tulane University). Sociology. New Orleans, Louisiana
- Ominsky, Mark (A.B., University of Pennsylvania). Psychology. Philadelphia, Pennsylvania
- Oskam, Robert Theo (A.B., Dickinson College). Political Science. Burlington, New Jersey
- Penn, William Melvin, Jr. (A.B., Western Maryland College). Economics. Baltimore, Maryland
- Pervan, Ralph F. (A.B., M.A., University of Western Australia). *Political Science*. South Perth, Australia
- Reid, Charles P. P. (B.S.F., University of Missouri). Forestry. Columbia, Missouri
- Sasser, William Earl (A.B., Duke University). Economics. Walterboro, South Carolina

Seldon, James Ralph (A.B., Carleton University). Economics. Ottawa, Ontario, Canada

Sims, Herbert Percival (B.S.F., University of British Columbia; M.F., Yale University). Forestry. Winnipeg, Canada

Smith, Mary Lee (A.B., University of Pennsylvania). *Economics*. Hamilton, Ohio Stack, Michael F. (A.B., M.A., University of Saskatchewan). *Philosophy*. Meadow Lake, Saskatchewan, Canada

Walker, George W. (A.B., Davidson College). German. Richmond, Virginia

Watt, Alan James (B.S., Sydney University). Forestry. Mosman, Australia Webbink, Douglas (A.B., Brown University). Economics. Durham, North Carolina Wilkinson, Thomas G. (B.S., M.F., Duke University). Forestry. Raiford, North

Carolina

Summer Scholars

Armitage, Christopher M. (A.B., M.A., Oxford University). English. London, Ontario, Canada

Breckenridge, George (M.A., Glasgow; M.A., Duke University). *Political Science*. Dumbarton, Scotland

Bushoven, Cornelius (A.B., Davidson College; M.A., Duke University). *Political Science*. Atlanta, Georgia

Chauhan, Pradyumna S. (A.B., Durbar College; M.A., University of Delphi). English. Jaipur, India

Curry, Lawrence H., Jr. (B.S., M.A., University of South Carolina). *History*. Greenville, South Carolina

Edmondson, Patricia B. (A.B., Midwestern University). *Political Science*. Chapel Hill, North Carolina

Goode, William O. (A.B., Washington and Lee University; M.A., Duke University).

Romance Languages. Chase City, Virginia

Gravely, William A., Jr. (A.B., Davidson College). Philosophy. Chapel Hill, North Carolina

Gray, James L. (A.B., Abilene Christian College; M.A., University of Texas). English. Llano, Texas

Gross, James R. (B.B.A., Wake Forest College; M.A., University of North Carolina).

English. Davidson, North Carolina

Higgins, W. Robert (A.B., M.A., University of South Carolina). History. Greenville, South Carolina

Hunken, Marie Lynn (B.S., College of William and Mary). Botany. Atlanta, Georgia

Jones, Philip D. (A.B., University of Cincinnati; M.A., Duke University). *History*. Wayne, West Virginia

Jorgensen, Richard S. (A.B., Dana College). History. Des Moines, Iowa

Keenan, Ann-Marie (A.B., Emmanuel College). Sociology. Jamaica Plain, Massachusetts

Koenning, Alton R. (A.B., Texas Lutheran College; B.D., Evangelical Lutheran Seminary). *Religion*. Ganado, Texas

Lincecum, Jerry B. (A.B., A&M College of Texas; M.A., Duke University). *English*. Thornton, Texas

Ludington, C. Townsend, Jr. (A.B., Yale University). English. Miami, Florida

Nelson, Paul D. (A.B., Berea College). History. Spencer, Virginia

O'Keefe, Charles F., Jr. (A.B., St Peter's College). Romance Languages. Jersey City, New Jersey

Penn, William M., Jr. (A.B., Western Maryland College). *Economics*. Baltimore, Maryland

Pisciotteli, Louis F. (A.B., Boston College). *Economics*. Belmont, Massachusetts Puryear, Jeffrey (A.B., Michigan State University). *Sociology*. Dimondale, Michigan Rayfield, David L. (A.B., Earlham College). *Philosophy*. Lake Wales, Florida

Richards, George D. (A.B., Hamilton College; M.A., Duke University). *English*. Utica, New York

Salstrom, John E. (A.B., Elmhurst College; B.D., Union Theological Seminary). *Religion*. Quincy, Illinois

Schmid, Byron Lee (A.B., Augsburg; B.D., Philadelphia Lutheran Seminary).

Political Science. Braham, Minnesota

Thomason, Michael V. (A.B., University of the South; M.A., Duke University). *History*. West Palm Beach, Florida

Zwick, Peter R. (A.B., Grinnell College). Political Science. Brooklyn, New York

Travel Awards

Breckenridge, George B. (M.A., Glasgow; M.A., Duke University). *Political Science*. Dumbarton, Scotland

Burke, Michael E. (A.B., Holy Cross College). *History*. Wayland, Massachusetts Cain, Robert J. (A.B., Wake Forest College). *History*. Winston-Salem, North Carolina

Clarke, Jeffrey J. (A.B., Gettysburg College; M.A., Duke University). History. Nutley, New Jersey

Corcoran, Alyse G. (A.B., Rollins College; M.Ed., Duke University). Education. Asheville, North Carolina

Donathan, Carl D. (A.B., University of Nevada; M.A., Duke University). History. Sparks, Nevada

Enstam, Elizabeth (A.B., Wake Forest College; M.A., Emory University). History. Mount Airy, North Carolina

Foster, Elliott O., III (A.B., Ohio Wesleyan University; M.A., Syracuse University). History. Shrewsbury, Massachusetts

Jones, Eldon L. (A.B., University of Texas). History. Houston, Texas

Killion, Howard R. (A.B., Westmont College). *History*. Forest Falls, California Morganroth, Judith L. (A.B., Barnard College). *Romance Languages*. Yonkers, New York

Ryland, R. Shane (A.B., M.A., University of British Columbia; M.A., Duke University). *History*. Royston, British Columbia, Canada

Saide, Frederick (A.B., Adelphi University; M.A., Duke University). History. Brooklyn, New York

Sanders, Richard W. (A.B., Ursinus College; M.A., Duke University). History. Jenkintown, Pennsylvania

Spaulding, James E. (A.B., Duke University; M.A., Stetson University). History. Deland, Florida

Graduate Scholars

Applebaum, Gerald (A.B., University of Toronto). Sociology. Toronto, Ontario, Canada

Armistead, Jack M. (A.B., Michigan State University). English. East Lansing, Michigan

Arndt, Murray (A.B., M.A., Catholic University). English. Waukesha, Wisconsin Au, Shu-fun (B.Sc., New Asia College; M.A., Duke University). Botany. Hong Kong, China

Avinger, Robert (A.B., Davidson College). Economics. Durham, North Carolina

Battistone, Joseph J. (A.B., La Sierra College; M.A., Andrews University; B.D., Seventh Day Adventist Theological Seminary). *Religion*. Durham, North Carolina

Beauchamp, Richard A. (A.B., Randolph-Macon College; B.D., Yale Divinity School). *Religion*. Goochland, Virginia

Berger, Thomas L. (A.B., Dartmouth College; M.A., San Jose State College). English. Menlo Park, California

Berry, Willard M. (A.B., Pomona College; M.A., Duke University). *Political Science*. Whittier, California

Blanks, Mary M. (A.B., East Central State College). *Hospital Administration*. Ada, Oklahoma

Bourque, Linda Brookover (A.B., Indiana University; M.A., Duke University). Sociology. East Lansing, Michigan

Bowman, Carolyn Janette (A.B., Lenoir Rhyne College). Romance Languages. Hickory, North Carolina

Broussard, James H. (A.B., Harvard College; M.A., Duke University). *History*. Durham, North Carolina

Burke, Michael E. (A.B., Holy Cross University). *History*. Durham, North Carolina Cain, Marvin F. (B.S.E.E., Washington State; B.D., Lutheran Theological Seminary; Th.M., Union Seminary). *Religion*. Peyallup, Washington

Cannon, Dale (A.B., Seattle Pacific College). Religion. Cottage Grove, Oregon Charlesworth, James H. (A.B., Ohio Wesleyan University; B.D., Duke University). Religion. Ponte Vedra Beach, Florida

Chauhan, P. S. (A.B., Durbar College; M.A., University of Delhi). *English*. Rewa (M.P.) India

Chestnut, Paul I. (A.B., Duke University; B.D., Yale University). *History*. Charleston, South Carolina

Church, Roderick A. (A.B., University of British Columbia). *Political Science*. Richmond, British Columbia, Canada

Clarke, Jeffrey J. (A.B., Gettysburg College). History. Durham, North Carolina

Cole, Robert R. (A.B., Drew University). Political Science. Chester, New Jersey

Comer, William J. (B.S., David Lipscomb College). Hospital Administration.
Nashville, Tennessee

Cooper, Fraser Barry (A.B., University of British Columbia). *Political Science*. Vancouver, British Columbia, Canada

Daniel, Amiram (B.S., Duke University). Biochemistry. Ramat Gan, Israel

Dawson, C. Stuart (B.S., University of North Carolina; M.B.A., Harvard University; M.A., American University). *Psychology*. Charleston, South Carolina

Dendy, John O. (A.B., Royal Military College; M.A., Carleton University). *History*. North Bay, Ontario, Canada

Dickinson, Avery Hayden (A.B., Mt. Holyoke College). Anatomy. Summit, New Jersey

Dickison, Robert B. B. (B.Sc., Acadia University). Forestry. Nashwaaksis, New Brunswick, Canada

Donathan, Carl Dale (A.B., University of Nevada; M.A., Duke University). *History*. Sparks, Nevada

Edwards, Larry G. (A.B., Salem College). History. Newport, Delaware

Embry, Charles R. (A.B., Louisiana Polytechnic Institute; M.A., Louisiana State University). *Political Science*. Baton Rouge, Louisiana

Fessler, Wayne F. (B.S., University of Missouri). Hospital Administration. Hazelwood, Missouri

Field, James A. (A.B., Harvard College). English. McKenzie, Tennessee

- Foster, Elliott (A.B., Ohio Wesleyan University; M.A., Syracuse University). History. Shrewsbury, Massachusetts
- Frankel, Allen Barry (A.B., Harpur College). *Economics*. Brooklyn, New York Furey, Marguerite (A.B., College of William and Mary). *German*. Williamsburg, Virginia
- George, Allaire A. (A.B., Wittenberg University; M.A., Duke University). Sociology. Springfield, Ohio
- Goldman, Terry (A.B., University of California). *Psychology*. Westport, Connecticut Gorbet, Charlene G. Harris (A.B., York University). *English*. Willowdale, Ontario, Canada
- Gravely, William Bernard (A.B., Wofford College; B.D., Drew University). Religion. Pickens, South Carolina
- Grunes, Rodney A. (A.B., Drew University). Political Science. Durham, North Carolina
- Gutman, Stanley T. (A.B., Hamilton College). English. Merrick, New York
- Haddox, Michael (A.B., Stetson University; B.D., Southern Baptist Seminary).
 Religion. St. Cloud, Florida
- Haire, Koleen (A.B., M.A., Duke University). History. Tallahassee, Florida
- Hawthorne, James (A.B., University of Victoria). Psychology. Victoria, Canada
- Hewett, Barbara B. (A.B., Duke University). Psychology. High Point, North Carolina
- Holdt, David M. (A.B., Wesleyan University). History. Stratford, Connecticut Hopkins, G. Stephen (A.B., Duke University). Hospital Administration. Avon, Connecticut
- Hoque, A. N. Shamsul (A.B., M.A., Dacca University). *Political Science*. East Pakistan
- Humphrey, Elizabeth (A.B., M.A., Emory University). Romance Languages. Atlanta, Georgia
- Hyatt, Robert P. (A.B., University of North Carolina; B.D., Yale Divinity School; Th.M., Duke University). *Political Science*. Chapel Hill, North Carolina
- Jones, Eldon Lewis (A.B., University of Texas; M.A., Duke University). History. Houston, Texas
- Jones, Peter D. (B.Sc., M.Sc., Victoria University). Biochemistry. Palmerston, North, New Zealand
- Jones, Robyn A. (A.B., Elmira College). Romance Languages. Massapequa, New York
- King, Edward B. (A.B., University of the South; B.D., Seabury Theological Seminary). History. Tampa, Florida
- Kirkwood, James J. (A.B., M.A., Wake Forest College). English. Buies Creek, North Carolina
- Kletzien, Ralph W. (B.S., Syracuse University). Hospital Administration. Swarthmore, Pennsylvania
- Koenning, Alton R. (A.B., Texas Lutheran College; B.D., Evangelical Lutheran Seminary). *Religion*. Ganado, Texas
- Locke, Elizabeth Hughes (A.B., Duke University; M.A., University of North Carolina). English. Durham, North Carolina
- Lopp, David W. (B.S., Davidson College). Hospital Administration. Reidsville, North Carolina
- Lummus, Edward I. (A.B., Transylvania College). Hospital Administration. Lexington, Kentucky
- McAdams, Donald R. (A.B., Columbia Union College; M.A., Duke University). History. Takoma Park, Maryland

Marcelle, Ronald E. (B.S., Millersville State College; M.A., Duke University). History. Wrightsville, Pennsylvania

Massey, Robert K., Jr. (A.B., Amherst College; M.A., University of Iowa). History.

Holden, Massachusetts

Mattice, Wayne (A.B., Grinnell College). *Biochemistry*. Durham, North Carolina Menning, Bruce W. (A.B., St. Johns University). *History*. Minneapolis, Minnesota Miao, Raymond (A.B., Queens College). *Biochemistry*. Flushington, New York Miller, Gene (A.B., B.D., Anderson College). *Religion*. Anderson, Indiana

Moore, Mathew S. (A.B., University of Florida). English. Sarasota, Florida

Morton, Charles J. (B.S., M.S., East Stroudsburg). History. Cornwells Heights, Pennsylvania

Murphy, Richard (A.B., University of Notre Dame; M.A., Loyola University). English. N. Providence, Rhode Island

Nelson, Paul David (A.B., Berea College). History. Spencer, Virginia

Nurkin, Harry A. (A.B., Duke University). Hospital Administration. Durham, North Carolina

O'Keefe, Charles (A.B., St. Peter's College). Romance Languages. Jersey City, New Jersey

Oyewole, Anthony (A.B., Duke University). Political Science. Durham, North Carolina

Page, Allen F. (A.B., Wake Forest College; B.D., Union Theological Seminary). Religion. Morrisville, North Carolina

Paramesh, C. R. (A.B., M.A., Presidency College). Psychology. Madras, India

Patterson, Ersa C. (A.B., Carson-Newman College). German. Maryville, Tennessee Peek, Charles W., III (A.B., M.A., University of Georgia). Sociology. Cedartown, Georgia

Pelkonen, J. Peter (A.B., Wittenberg College; B.D., Hamma Divinity School). Religion. Palatka, Florida

Peterson, John M. (A.B., Grinnell College). Biochemistry. Moline, Illinois

Philips, Howard M., Jr. (A.B., Emory University). History. W. Birmingham, Alabama

Pisciotteli, Louis Francis (A.B., Boston College). *Economics*. Belmont, Massachusetts.

Polhemus, James H. (B.S., University of Tennessee; M.A., University of Virginia). *Political Science* Mascot, Tennessee

Posey, Carolyn Jane (A.B., Rice University). English. Houston, Texas

Prust, Richard C. (A.B., University of Wisconsin; B.D., Yale University). *Religion*. Milwaukee, Wisconsin

Rahman, A. T. Rafique (A.B., M.A., Dacca University). Political Science. E. Pakistan

Ray, Roger Dale (A.B., Baylor University; B.D., Southern Baptist Theological Seminary). Religion. Corsicana, Texas

Rees, James (A.B., Princeton University). *Psychology*. Durham, North Carolina Reinhardt, William W. (A.B., M.A., Duke University). *History*. South Orange

Reinhardt, William W. (A.B., M.A., Duke University). *History*. South Orange, New Jersey
Ridenhour, Thomas E. (A.B., Davidson College; B.D., Lutheran Theological Semi-

nary). Religion. Concord, North Carolina

Ross, Grace (A.B., M.A.T., Duke University). Education. Durham, North Carolina Sallstrom, John (A.B., Elmherst College; B.D., Union Seminary of New York). Religion. Quincy, Illinois

Sandres, Richard W. (A.B., Ursinus College; M.A., Duke University). History. Jenkinstown, North Carolina

Scott, Robert T. (B.S., University of Virginia; B.D., Virginia Theological Seminary; Th.M., Duke University). *Religion*. Durham, North Carolina

Spaulding, James E. (A.B., Duke University; M.A., Stetson University). History. Durham, North Carolina

Stephenson, Keith D. (A.B., University of Nebraska; B.D., Yale University). Religion. Durham, North Carolina

Stith, James R. (A.B., Grinnell College). Hospital Administration. Oklahoma City, Oklahoma

Sy, Jose (B.S., Adamson University). Biochemistry. Manila, Philippines

Turner, Wesley B. (A.B., M.A., University of Toronto). History. Western Ontario, Canada

Tuttle, Lynn S. (A.B., Duke University). Hospital Administration. Gainesville, Florida

Wagner, Frederick R. (A.B., M.A., Duke University). English. Durham, North Carolina

Wang, Yu-min (B.S.F., Chung-hsing University; M.F., University of British Columbia). Forestry. Taiwan, China

Weigant, Leo Augustus (A.B., M.A., University of Michigan). English. Mt. Pleasant, Michigan

White, Marcia B. (A.B., Wake Forest College). Religion. Forest City, North Carolina

Graduate Assistants

Amstutz, Larry I. (A.B., College of Wooster). Physics. Smithville, Ohio

Anliot, Sture Fredrik (A.B., Antioch College; M.S., University of Chicago). Botany. Cleveland, Ohio

Applebaum, Gerald M. (A.B., University of Toronto). Sociology. Toronto, Canada Baker, William M. (A.B., Oberlin College). Psychology. Atlanta, Georgia

Bendiner, William Paul (A.B., Amherst College). Physics. Huntington, L.I., New York

Beron, Sonia (A.B., Hunter College; M.A., Pennsylvania State University). Romance Languages. Forest Hills, New York

Boyce, James R., Jr. (B.S., Florida State University). *Physics*. Tallahassee, Florida Brigner, William Leonard (A.B., DePauw University; M.S., Purdue University). *Psychology*. Raleigh, North Carolina

Burger, Francis J. (B.S., Tennessee Wesleyan College; M.A., Duke University). *Chemistry*. Riceville, Tennessee

Burns, Dorothy (A.B., Agnes Scott College). Anatomy. West Palm Beach, Florida Caldwell, Martyn Mathews (B.S., Colorado State College). Botany. Denver, Colorado

Chabot, Brian Frank (B.S., College of William and Mary). Botany. Williamsburg, Virginia

Cleary, William James (A.B., Southern Illinois University). Geology. Florissant, Missouri

Coleman, Heyward Hamilton (A.B., University of the South). Physics. Charleston, South Carolina

Craddock, Richard S. (A.B., University of North Carolina; M.Ed., Duke University).

Education. Durham, North Carolina

Davis, James E. (A.B., Occidental College). Chemistry. Montebello, California Dessent, Thomas A. (B.S., West Virginia Wesleyan College). Chemistry. Weston, West Virginia

Dillon, John R. (A.B., Gettysburg College). Zoology. Baltimore, Maryland Dorsey, Frank (A.B., Brown University). Mathematics. Phoenix, Maryland Doyle, Larry James (A.B., Duke University). Geology. Simsbury, Connecticut Dunlop, Charles (A.B., Stanford University). Philosophy. Evanston, Illinois

Eberle, Kathryn M. (A.B., Loyola University). Romance Languages. Metairie, Louisiana

Estes, Ernest Lathan, III (A.B., Lawrence University). *Geology*. Racine, Wisconsin Fedak, Michael A. (A.B., Rutgers University). *Zoology*. Roselle, New Jersey Fiore, James (A.B., Harpur College). *Botany*. Seaford, New York

Foster, Robin Bradford (A.B., Dartmouth College). Botany. South Windham,

Vermont

Fowler, Mary K. (B.S., Limestone College). *Chemistry*. Gaffney, South Carolina Frank, Richard (A.B., Blackburn College; M.A., Southern Illinois University). *Chemistry*. Carlinville, Illinois

Fratcher, Nancy J. (A.B., Lawrence University). Chemistry. Milwaukee, Wisconsin Garthright, Wallace E., Jr. (A.B., Richmond College). Mathematics. Cherry Hill,

New Jersey

Golson, James Philip (B.S., Auburn University). *Physics*. Billingsley, Alabama Graham, David M. (A.B., American International College). *Chemistry*. Cheshire, Connecticut

Griffin, Brenda Walker (A.B., Vanderbilt University). Chemistry. Morristown, Tennessee

Griffiths, Jonathan S. (A.B., Gettysburg College). Chemistry. Leonia, New Jersey Grilliot, Thomas J. (B.S., University of Dayton). Mathematics. Dayton, Ohio Hagglund, Lee Oliver (A.B., Gustavus Adolphus). Mathematics. St. Peter, Minnesota

Haines, Bruce Lee (A.B., M.A., University of California). Botany. Topanga, California

Harkins, Anna M. (B.S., Texas Christian University). Chemistry. Fort Worth, Texas

Harris, Norman E., III (B.S., Bucknell University). Physics. Salem, New Jersey

Hawks, Richard L. (B.S., University of Richmond). *Chemistry*. Richmond, Virginia Hemmes, Richard B. (A.B., Antioch College). *Zoology*. Chapel Hill, North Carolina Holmes, John L. (B.S., Philadelphia College of Textiles and Sciences). *Chemistry*. Bala-Cynwyd, Pennsylvania

Horsley, Jane Eileen (B.S., University of Connecticut). Education. Cincinnati, Ohio

Hunken, Marie Lynn (B.S., College of William and Mary). Botany. Atlanta, Georgia

Jorgeson, Eric Charles (B.S., West Virginia University). Geology. Lake Waccamaw, North Carolina

Khokhlov, Nikolai (B.S., University of Moscow). Psychology. Germany

Kiltinen, John (A.B., North Michigan University). Mathematics. Marquette, Michigan

Koenig, Albert August, III (B.S., Loyola College). *Physics*. Baltimore, Maryland Lamaze, George Paul (A.B., Florida State University). *Physics*. Tampa, Florida Lambe, Catherine U. (A.B., University of North Carolina). *Zoology*. Durham, North Carolina

Lanier, Ruby (A.B., Lenior Rhyne College; M.A., Appalachian State Teachers

College). Education. Boone, North Carolina

Laube, Elzie V. (B.S., M.S., University of Wisconsin). Botany. Brodhead, Wisconsin Lawrence, Michael B. (B.S., Stetson University). Chemistry. St. Petersburg, Florida Lea, Suzanne Moore (A.B., Rice University; M.S., Ohio State University). Physics. Greensboro, North Carolina

Leversee, Gordon J., Jr. (A.B., Dartmouth College). Zoology. Cohoes, New York Lopez-Cepero, Arnold B. (B.S., Yale University; M.A., Wesleyan University).

Physics. Durham, North Carolina

Lucke, James Bennett (A.B., Whitman College). Mathematics. Portland, Oregon

- McAllister, Ronald (A.B., Merrimack College). Sociology. Andover, Massachusetts McDonald, Dennis L. (B.S., Valparaiso University). Zoology. Glenns Ferry, Idaho Melbye, Melinda L. (A.B., Middlebury College). Zoology. South Yarmouth, Massachusetts
- Meredith, Philip L. (A.B., Western Maryland College). Chemistry. Westminster, Maryland
- Millikan, George C. (A.B., Harvard University). Zoology. Berkeley, California Milton, E. O., III (A.B., Swarthmore College). Mathematics. Alcoa, Tennessee Mohan, Rahde (B.S., Panjab University; M.S., University of Chandigarh). Physics.

Panjab, India

Oniversity; M.S., University of Chandigarh). Physics

Moses, John D. (B.S., Georgia Institute of Technology). *Physics*. Georgetown, South Carolina

Moss, Beverly J. (A.B., Duke University). Romance Languages. Ocala, Florida Mueller, Karl Hugo (A.B., Rice University). Physics. Fort Worth, Texas

Nutt, William R. (A.B., Ohio Wesleyan University). Chemistry. Delaware, Ohio

O'Mara, James H. (B.S., George Washington University). Chemistry. Springfield, Virginia

Osgood, David W. (B.S., Portland State College; M.A., Duke University). Zoology. Portland, Oregon

Paige, Harvey L. (A.B., Alfred University). Chemistry. Trumansburg, New York Parramore, Barbara M. (A.B., University of North Carolina at Greensboro). Education. Raleigh, North Carolina

Parrott, Roger Thomas (M.A., Cambridge University; M.S., Adelaide University).

Botany. Surrey, England

Potts, Mary E. (A.B., Wells College). Zoology. Glen Cove, L. I., New York Pronge, Henry D. (A.B., Duke University). Zoology. Durham, North Carolina

Pulliam, Howard R. (B.S., University of Georgia). Zoology. Augusta, Georgia Quinton, Harold Wayne (B.S., Atlantic Christian College). Education. Durham,

North Carolina
Ramm, Hartmut (B.S., University of Tennessee). Physics. Manchester, Tennessee
Rees, James (A.B., Princeton University). Psychology. Durham, North Carolina
Robertson, Ralph B. (B.S., Virginia Military Institute). Physics. Richmond, Virginia
Romine, Benjamin H., Jr. (A.B., Florida State University; M.A., Duke University).

Education. Durham, North Carolina

Roy, Raymond C. (B.Sc., University of Pennsylvania). Chemistry. Marietta,

Georgia

Rubin, Byron H. (A.B., Reed College). Chemistry. Chicago, Illinois

Russell, John W. (B.S., University of Richmond). Chemistry. Midlothian, Virginia

Ryali, Rajogopal (A.B., Presidency College). Sociology. Madras, India Sanning, Kenneth J. (B.S., Oberlin College). Chemistry. Cincinnati, Ohio

Scott, Barbara J. (B.S., University of Chicago). Zoology. Chicago, Illinois

Sherwin, Priscilla A. (A.B., Pomona College). Botany. Arlington, Virginia

Shipp, Warner Lewis, Jr. (B.S., Hampden-Sydney College). Mathematics. Durham, North Carolina

Shontz, John Paul (B.S., Edinboro State College; M.A., Miami University). Botany. Conneaut Lake, Pennsylvania

Shuping, Clyde A. (B.S., Lenoir Rhyne College; M.A., Appalachian State Teachers College). *Education*. Valdese, North Carolina

Smith, James C., Jr. (B.S., Davidson College). *Mathematics*. Hampton, Virginia Soltau, Susan Kae (B.S., Florida Presbyterian). Zoology. Atlanta, Georgia

Soniat, Leonard (B.S., Louisiana State University). Mathematics. Durham, North Carolina

Stallings, Ann Coble (A.B., Duke University). Education. Durham, North Carolina

Standaert, Thomas A. (A.B., Montclair State College). Zoology. Hawthorne, New Jersey

Stewart, Martin V. (B.S., Emory University). Chemistry. Albany, Georgia

Sulkin, Stephen D. (A.B., Miami University). Zoology. Winston-Salem, North Carolina

Taylor, Charles R. (B.S., Ohio University). Chemistry. London, Ohio

Taylor, John, Jr. (B.S., University of South Carolina). Physics. Durham, North Carolina

Terlecky, Peter Michael (A.B., University of Buffalo). Geology. Elmira, New York Tonzetich, John (B.Sc., University of British Columbia). Zoology. Nanaimo, British Columbia, Canada

Turner, William G. (B.S., University of Missouri at Kansas City). Geology. Kansas City, Missouri

Vacca, Richard S. (A.B., Lafayette College; M.S., State University of New York). Education. Schenectady, New York

Valiela, Diana (A.B., Douglass College). Zoology. Potsdam, New York

Walker, George L. (B.S., Southwestern at Memphis). Chemistry. Memphis, Tennessee

Weaver, Richard Edwin, Jr. (B.S., Millersville State College). *Botany*. Richland, Pennsylvania

Williams, Peter (A.B., Leicester University; M.A., McMasters University). Sociology. Hamilton, Ontario, Canada

Wilson, Marshall M. (A.B., Carson-Newman College). Education. Martinsville, Virginia

Zander, Richard Henry (A.B., Hiram College). Botany. Cleveland, Ohio

Zane, Leonard (B.S., City College of New York). *Physics*. Long Island City, New York

Ford Honors-Masters Fellows

Anna, Timothy E. (A.B., Duke University). *History*. Clearwater, Florida Beineke, Betsy L. (A.B., Duke University). *Zoology*. Fort Thomas, Kentucky Boyte, Sara Margaret E. (A.B., Duke University). *Political Science*. Dallas, Texas Marks, Margaret L. (A.B., Furman University). English. Laurens, South Carolina Tilley, David H. (A.B., Duke University). *English*. Durham, North Carolina

Doris Duke Russian Affairs Fellow

Zwick, Peter R. (A.B., Grinnell College). Political Science. Brooklyn, New York

United Negro College Fund Fellow

Wright, William (A.B., Paine College). Romance Languages. Vidalia, Georgia

Freie Universitat Berlin Exchange Fellows

Almers, Wolfhard (Dr.Med., Freie Universitat Berlin). *Physiology*. Berlin, Germany Eichler, Margrit E. (Diploma, Freie Universitat Berlin). *Sociology*. Walter Flexstr, Germany

Moylan, Patricia M. (A.B., University of Hartford; M.A., Rutgers University). English. West Hartford, Connecticut

Saide, Frederick (A.B., Adelphi University). History. Brooklyn, New York

Departmental Research Associates, Fellows, Scholars, and Assistants

Department of Biochemistry

U. S. Public Health Service Predoctoral Trainees

Arneson, Richard M. (A.B., University of Minnesota). Minneapolis, Minnesota Aune, Kirk C. (A.B., University of Minnesota). Winona, Minnesota

Autor, Anne P. (A.B., M.Sc., University of British Columbia). Durham, North

Barnes, Eugene M. (B.S., University of Kentucky). Versailles, Kentucky

Brady, Frank O. (B.S., Carnegie Institute of Technology). Arlington Heights, Illinois

Collins, Carolyn J. (A.B., Skidmore College). Naples, Florida Connett, Richard J. (A.B., Park College). Saltville, Virginia

Cox, Andrew C. (M.S., University of Houston). Brookhaven, Mississippi

Derge, Jeffery G. (A.B., Amherst). Pittsburgh, Pennsylvania

Duch, David (B.S., University of Scranton). Dickson City, Pennsylvania

Ellis, Eleanor H. (B.S., Southwestern at Memphis). Memphis, Tennessee

Foote, Robert S. (B.S., Morris Harvey College). South Charleston, West Virginia

Frankfater, Allen (B.S., Brooklyn College). Brooklyn, New York

Geller, Arthur M. (B.S., City College of New York). Brooklyn, New York Gormus, Bobby J. (B.S., University of Richmond). Richmond, Virginia

Gruenstein, Eric I. (A.B., Princeton University). Great Neck, Long Island, New York

Hilt, Margaret A. (A.B., Wilmington College). Piketon, Ohio

Hooper, John A. (M.S., Texas A and M University). McKinney, Texas Marcus, Carol S. (B.S., Cornell University). Little Neck, New York

Mattice, Wayne L. (A.B., Grinnell College). Sioux Falls, South Dakota

Naylor, James F., III (B.S., Louisiana Polytechnical Institute). Baton Rouge, Louisiana

Neece, Margaret H. (A.B., Hendrix College). Pine Bluff, Arkansas

Plate, Charles A. (M.S., State University of New York College of Forestry). Butte,

Raff, Rudolf A. (B.S., Pennsylvania State University). Pullman, Washington

Rostand, Katherine S. (A.B., Smith College). Satellite, Florida

Turner, Stephen R. (B.S., University of Rochester). Silver Spring, Maryland

Weaver, Robert F. (A.B., Wooster College). Arlington, Virginia

White-Stevens, Rodric H. (B.S., Massachusetts Institute of Technology). Hopewell, New Jersey

Wilhelm, John A. (B.S., Tulane University). Bartlesville, Oklahoma Woodward, Clifford B., III (A.B., University of Texas). Anchorage, Kentucky

U. S. Public Health Service Predoctoral Fellowships

Coch, Emily H. (B.S., City College of New York). Forest Hills, New York Duttera, Carolyn M. (A.B., Duke University). Huntington, West Virginia Howell, Larry C. (A.B., Northwestern University). Evanston, Illinois McGregor, Irmgard K. (A.B., Duke University). Milledgeville, Georgia Murphy, Patricia D. (A.B., Drew University). Riverhead, New York Ovrut, Claire A. (B.S., City College of New York). Bronx, New York Parsons, John T. (A.B., DePauw University). Valparaiso, Indiana Peterson, John M. (A.B., Grinnell College). Moline, Illinois Raff, Elizabeth C. (B.S., Pennsylvania State University). Chevy Chase, Maryland Robinson, George W. (A.B., Centre College of Kentucky). Lexington, Kentucky Tanis, Robert (B.S., Notre Dame University). Traverse City, Michigan Trimble, Martha F. (A.B., Smith College). Princeton, New Jersey Vanaman, Thomas C. (B.S., University of Kentucky). Lexington, Kentucky

U. S. Public Health Service Research Assistants

Chang, Zer Yuang (B.S., National Taiwan University). Taiwan, Formosa Daniel, Amiram (B.S., Duke University). Ramat-Gan, Israel Hoerz, Wolfram (B.S., Uni Wien, University of Hamburg). Nuertingen, Germany Jones, Peter D. (M.Sc., Victoria University of Wellington). Palmerston North, New Zealand

Kashmiri, Syed V. (M.S., Lucknow University). Lucknow, India Lin, Ching-hsiang (M.S., National Taiwan University). Taiwan, Formosa Miao, Raymond M. (A.B., Queens College). Flushing, New York Salahuddin, Ahmad (Ph.D., Aligarh Moslem University). Azamgarh, India Sy, Jose (B.S., Adamson University). Manila, Philippines

Department of Botany

Research Assistants

Baker, Robert A. (B.S., M.S., Florida State University). Tallahassee, Florida Bourque, Don P. (A.B., Johns Hopkins University). Babylon, New York Conde, Louis F. (B.S., Cornell University). Amsterdam, New York Fiscus, Edwin L. (B.S., Slippery Rock State College; M.S., University of Arizona).

scus, Edwin L. (B.S., Slippery Rock State College; M.S., University of Arizona)
New Castle, Pennsylvania

Godfrey, Paul J. (B.S., University of Connecticut). Abington, Connecticut Howard, Kenneth L. (B.S., University of Massachusetts). Milford, Massachusetts Mackey, Brenda L. (B.S., Danbury State College). Fairfield, Connecticut Mowbray, Thomas B. (A.B., University of Minnesota; M.A., Duke University). Duluth, Minnesota

Racine, Charles H. (A.B., Dartmouth College; M.A., Duke University). Hinsdale, Illinois

Rosenthal, Gerald A. (B.S., Syracuse University). Brookline, Massachusetts

Stanley, Ronald A. (B.S., M.S., University of Arkansas). El Dorado, Arkansas Thomas, Lindsey K. (B.S., Utah State University; M.S., Brigham Young University). Vienna, Virginia

Yu, Grace W. C. (B.S., National Taiwan University; M.S., Washington State University). Taipei, Taiwan

Department of Chemistry

Dupont Postgraduate Award Fellow

Bailey, John C. (A.B., Cornell University; M.A., Duke University). Scotia, New York

Allied Chemical Fellow

Costello, Martin J., III (B.S., George Washington University; M.A., Duke University). Arlington, Virginia

Research Assistants

Adachi, Tomio (B.S., M.S., Kyoto University). Shigaken, Japan

Bissell, Robert L. (A.B., Northwestern University; M.A., Columbia University). Hammond, Indiana

Brandau, Richard D. (A.B., Elmhurst College). Maywood, Illinois

Bryson, Jay G. (A.B., Rice University). Corpus Christi, Texas

Bushell, Alan W. (B.S., Queens College; M.A., Duke University). Flushing, New York

Clapp, William L. (B.S., Wake Forest College; M.A., Duke University). Spartanburg, South Carolina

Crowther, Gary P. (A.B., Thiel College). Greenville, Pennsylvania

Dale, Stephen W. (B.S., Emory University; M.A., Duke University). Miami, Florida

Gratz, Roy F. (B.S., University of Pittsburgh). Pittsburgh, Pennsylvania

Henoch, Frederick E. (B.S., Indiana University). LaPorte, Indiana

Hsieh, Wen-cheng (B.S., Tunghai University; M.S., Wichita State University). Taiwan, China

Ludt, Robert E. (A.B., Thiel College). Poland, Ohio

Moseley, Robert W. (B.S., Wagner College). Lenox, Massachusetts

Nelson. Charles J. (A.B., Beloit College; M.A., Duke University). Mt. Prospect, Illinois

Nutt, Roger W. (A.B., Ohio Wesleyan University). Delaware, Ohio Paige, Harvey L. (A.B., Alfred University). Trumansburg, New York

Pinion, Dallas O. (A.B., M.S., University of Richmond). Richmond, Virginia

Schwarz, Richard A. (B.S., Massachusetts Institute of Technology). Shaker Heights, Ohio

Shelburne, Frank A. (B.S., University of North Carolina; M.A., Duke University). Durham, North Carolina

Voigt, Charles F. (A.B., University of South Florida). St. Petersburg, Florida

Research Associates

Amoros-Marin, Luis (Ph.D., Carnegie Institute of Technology). Rio Piedras, Puerto Rico

Augstein, Wolfgang (Ph.D., Justus Liebig University of Giessen). Giessen/Lahn, Germany

Barnish, Ian T. (Ph.D., The Manchester College of Science and Technology). Preston, Lancashire, England

Caputo, Joseph A. (Ph.D., University of Houston). Jersey City, New Jersey Denney, Ronald C. (Ph.D., Sir John Cass College). Essex, England

Fox, Winston M. (Ph.D., The University, Leicester, England). Clowne, Chesterfield, England

Honjoh, Masao (Ph.D., University of California, Berkeley). Durham, North Carolina Maguire, Walter (Ph.D., Queen's University of Belfast). Tyrone, North Ireland Mao, Chung-ling (Ph.D., Virginia Polytechnic Institute). Blacksburg, Virginia Martz, Michael D. (Ph.D., University of Missouri). Columbia, Missouri

Nyberg, Graeme (Ph.D., University Chemical Laboratory, Cambridge). Cambridge, England

Prince, René (Ph.D., University of Geneve). Genéve, Switzerland

Smith, Roy E. (Ph.D., University of North Carolina). Chapel Hill, North Carolina Watanabe, Hamao (Ph.D., Tokyo Metropolitan University). Shizuoka-ken, Japan Weber, Wolfgang (Ph.D., Heidelberg University). Mannheim, Germany Wineholt, Robert L. (Ph.D., University of Delaware). Durham, North Carolina

Army Research Office of Durham Senior Research Associate

Niedenzu, Kurt (Ph.D., Heidelberg University). Durham, North Carolina

Department of Civil Engineering

Teaching Assistants

Ali, Mohammed Sadiq (B.S., D.J., Government Science College; B.S.E., NED Govvernment Engineering College). Karachi, Pakistan

Guimaraes, Jerson D. (Civil Engineer, University of Minas Gerais). Goiás, Brazil Khalaf, Ali (B.S., Shams University; M.S. Industrial Engineering, University of Minnesota). Heliopolis, Egypt

Liu, Thou-Han (B.S., Taiwan Provincial Cheng Kung University). Taiwan, China Lu, Tyzz-Dwo (B.S. in Engineering, National Taiwan University). Taiwan, China Querejeta, Pedro J. (B.C.E., Catholic University of America). Madrid, Spain

Saxena, Surendra (B.Sc. (Engineering), Aligarh University; M.S., Duke University). Rajasthan, India

Toussaint, Gerard (B.S., Ecole Nationale des Arts et Manufactures). Paris, France Wu, Dong-Shan (B.S., Cheng Kung University). Chang-hua Hsien, Taiwan, China

Supervised Teaching Interns

Coffin, George K. (B.S., Mississippi State University). Laurel, Mississippi Koerner, R. M. (B.S.C.E., M.S.C.E., Drexel Institute of Technology). Norwood, Pennsylvania

Research Assistants

Cruz, Leonardo V. (B.S. in C.E., University of Philippines; M. Engineering, Seato Graduate School in Engineering). Bulcan, Philippines

Esquivel, Raul F. (Civil Engineer, La Universidad National Autonoma de Mexico). Mexico City, Mexico

Hu, Chao-Hsiung (B.Sc., Taiwan Provincial Cheng Kung University). Taiwan, China Morrow, Joe W. (B.S., Mississippi State University). Huntsville, Alabama

Moussa, Mohamed Mamdouh (B.S.C.E., Cairo University). Giza, U.A.R.

Shih, Cheng-chuan (B.Sc., Taiwan Provincial Cheng Kung University; M.S., Virginia Polytechnic Institute). Formosa, China

Tai, Tein-Lie (B.S.C.E. Taiwan Provincial Cheng Kung University; M.S.C.E., Georgia Institute of Technology). Taiwan, China

Tseng, Wen-Shou (B.S. Engineering, National Tiawan University). Taipei, Taiwan, China

Department of Economics

National Science Foundation—Simulation Studies Program Research Assistantship

Althaus, Paul G. (B.A., Gettysburg College). York, Pennsylvania

National Institutes of Health Population Studies Traineeships

Bower, Leonard G. (B.A., University of Arizona). Blythe, California Fairchild, Charles K. (B.A., American University). Mt. Gilead, Ohio Lindeman, J. Bruce (B.A., Syracuse University). Syracuse, New York

Fulbright Fellowship

Brau, Eduard H. (Universities of Gottingen and West Berlin). Bremen-Blumenthal, Germany

Council of State Governments Fellowship in State-Local Government

Crowley, Ronald W. (B.A., Bishop's University). Quebec, Canada

Duke Council on Hispanic Research Fellowship

Hernandez, Francisco J. (B.A., University of Florida). Belle Glade, Florida

Population Council Fellowship

Javid, Khwaja R. (M.A., University of the Panjab). Lahore, Pakistan

H. B. Earhart Fellowship

Kincaid, Randall R., Jr. (A.B., Wofford College; A.M., Duke University). Quincy, Florida

Webbink, Douglas W. (B.A., Brown University). Scarsdale, New York

Department of Electrical Engineering

Teaching Assistants

Bemis, Albert R. (B.S.E.E., Kansas State; M.E.E., New York University). Burlington, Kansas

Buckley, George (B.Sc., Royal College of Advanced Technology). Newcastle-Upon-Tyne, England

Plumer, William S., Jr. (B.S. in E.E., Duke University). Durham, North Carolina

Supervised Teaching Interns

Griffin, James R. (B.E., M.S., Vanderbilt). Nashville, Tennessee Halford, Jake H. (B.S., University of South Carolina). Columbia, South Carolina

Research Assistants

Absher, Richard G. (B.S.E.E., Oklahoma State University; M.S.E.E., University of New Mexico). Miami, Oklahoma

Babaa, Ihsan (B.S.E.E., Illinois Institute of Technology). Tulkarn, Jordan

Chambers, William F. (B.S. in E.E., Duke University; M.S.E.E., Stanford University). High Rolls-Mountain Park, New Mexico

Feng, Yun-Ming (B.S. in Engineering, National Taiwan University). Taiwan, China Hammond, William Edward (B.S. in E.E., Duke University). Flat Rock, North Carolina

Hartwell, John W. (B.S., Duke University). Tampa, Florida

Hester, Donald L. (B.S.E.E., North Carolina State University; M.S.E.E., University of New Mexico). Stanley, North Carolina

Hunt, Joseph M., III (B.S. in E.E., Duke University; M.S., North Carolina State University). Greensboro, North Carolina

Jackson, Peter E. (B.S. in E.E., Duke University). Fayetteville, North Carolina Meyer, Donald T. (B.S., California Institute of Technology; M.A., Duke University). Durham, North Carolina

Roe, Robert B., Jr. (B.S.E.E., Clemson University). Greenville, South Carolina Willis, Candler A., Jr. (B.S., North Carolina State College). Candler, North Carolina Yu, Yuan (B.S., National Taiwan University). Vancouver, B.C., Canada

National Institutes of Health Trainees

Barnes, Ralph W. (M.S.E., University of Pennsylvania). Durham, North Carolina Barr, C. Roger (B.S., Duke University). Durham, North Carolina

Shell Fellows

McDowell, C. Blake, III (B.S.E.E., Duke University). Durham, North Carolina

Department of English

Harvey A. Baker Fellowship

Keates, Jon C. (A.B., Brown University). Hillsdale, New Jersey

Department of Forestry

School of Forestry Fellowships

Dickison, Robert B. B. (B.S., Acadia University). Nashwaaksis, N.B., Canada O'Neal, Thomas D. (B.S., Southern Illinois University; M.F., Duke University). Cape Girardeau, Missouri

Meadows, John C., Jr. (B.S., Auburn University; M.S., Georgia Institute of Technology). Vidalia, Georgia

Wilkinson, Thomas G. (B.S., M.F., Duke University). Durham, North Carolina
 Wang, Yu-Min (B.S.F., Chung-hsing University; M.F., University of British
 Columbia). Formosa

Government Employees Training Act

Boyer, William D. (B.S., U. S. Merchant Marine Academy; B.S., State University of New York, College of Forestry). Brewton, Alabama

Shoulders, Eugene (B.S.F., West Virginia University; M.F., Louisiana State University). Pineville, Louisiana

Research Assistantship—Duke Forest

Hay, Ronald L. (B.S., Southern Illinois University; M.F., Duke University). Macomb, Illinois

Research Assistantships—Forest Service Grant

Murphy, Charles E. (B.S., West Virginia Wesleyan; M.F., Duke University).

Califon, New Jersey

van Kesteren, Frido (B.S., Pennsylvania State University; M.F., Duke University). The Hague, Holland

Department of Geology

Research Assistants

Dill, Charles E., Jr. (A.B., Earlham College). Madison, New Jersey Kier, Jerry S. (A.B., Antioch College). Sharon, Massachusetts

Department of History

Council for Hispanic Research

Burke, Michael E. (A.B., Holy Cross; M.A., Duke University). Cochituate, Massachusetts

Donathan, Carl D. (A.B., University of Nevada; M.A., Duke University). Sparks, Nevada

Morton, Charles J. (B.S., M.S., East Stroudsburg State College). Cornwells Heights, Pennsylvania

Stoan, Stephen K. (A.B., M.A., University of Florida). Pensacola, Florida

International Business Machine Corporation Fellowship

Higgins, William R. (A.B., University of South Carolina). Greenville, South Carolina

History Department Readerships

Chase, Philander D. (A.B., North Carolina State University). Raleigh, North Carolina

Farthing, James D. (A.B., Oklahoma Baptist University). Shawnee, Oklahoma

Hargrove, Richard J., Jr. (A.B., Adelphi University). Woodside, New York Head, Marilyn Constance (A.B., M.A., Trinity University; B.D., Duke University). San Antonio, Texas

Huff, Archibald (A.B., Wofford College; B.D., Yale University). Columbia, South Carolina

Ross, John R. (A.B., Greensboro College; M.A.T., Duke University). Whiteville, North Carolina

Teaching Assistant

Werrell, Kenneth P. (B.S., United States Air Force Academy). Irvington, New Jersey

Humanities Council Award

Jones, Philip D. (A.B., University of Cincinnati; M.A., Duke University). Wayne, West Virginia

Pearson, Alden B., Jr. (A.B., M.A., Duke University; B.D., Princeton Theological Seminary). Raleigh, North Carolina

Tyler, Lyon G. (A.B., William and Mary College; LL.B., University of Virginia; M.A., Duke University). Charles City, Virginia

Hospital Administration

U.S. Public Health Service Traineeeship Awards

Klima, Dennis E. (B.S., University of Illinois). Park Ridge, Illinois Zuercher, William R. (A.B., Goshen College). Hagerstown, Md.

Department of Mathematics

Graduate Assistantship

Carmichael, Richard D. (B.S., Wake Forest College). High Point, North Carolina

Research Assistants

Dorsey, Frank C. (A.B., Brown University). Easthampton, Massachusetts

Garthright, Wallace E. (A.B., University of Richmond). Cherry Hill, New Jersey Grilliot, Thomas J. (B.S., University of Dayton). Dayton, Ohio

Grimson, Roger C. (B.S., University of North Carolina). Durham, North Carolina

Johnson, Ralph E. (A.B., University of Santa Clara). San Francisco, California Kiltinen, John O. (A.B., Northern Michigan University). Marquette, Michigan

Lucke, James B. (A.B., Whitman College). Portland, Oregon

Milton, Emmette O. (A.B., Swarthmore College). Alcoa, Tennessee

Nash, Humphrey H. (A.B., Long Island University). West Barrington, Rhode Island Parker, Henry L. (B.S., Davidson College; M.A., Duke University). Spartanburg, South Carolina

Reber, James C. (A.B., Indiana Central College). Dayton, Ohio

Reid, Lois J. (B.S., College of William and Mary; M.A., Duke University). Portsmouth, Virginia

Smith, James C. (B.S., Davidson College; M.A., College of William and Mary).

Martinsville, Virginia

Soniat, Leonard E. (B.S., Louisiana State University). Metairie, Louisiana Weber, James K. (B.S., Davidson College). Charlotte, North Carolina

Department of Mechanical Engineering

Teaching Assistants

Chen, David (B.S.M.E., National Taiwan University). Taipei, Taiwan, China Cheng, Eddy H. (B.S.M.E., Cheng Kung University). Taiwan, China Gaillard, Jean-Philipe (Diplome d'ingenieur, Ecole Centrale Lyonnaise). Lyon, France

Kumar, R. Vijay (B.E., Nizam College). Hyderabad, India

Lau, Henry (B.S.M.E., University of Tennessee). Kowloon, Hong Kong, China Lim, Alexander (B.S.M.E., University of Santo Tomas). Caloocan City, Philippines

Research Assistant

Crist, Peter (B.S.M.E., Duke University). Dowington, Pennsylvania

Department of Microbiology and Immunology

U.S. Public Health Service Predoctoral Trainees

Blasecki, John W., Jr. (B.S., B.Ph., Rutgers University). Fair Lawn, New Jersey Bolognesi, Dani P. (B.S., M.S., Rensselaer Polytechnic Institute). Troy, New York Brunovskis, Ilze W. (B.A., University of Connecticut). Waterbury, Connecticut Dorresteyn, Christine E. (A.B., Clark University). Malvern, New York

Fritz, Robert B. (A.B., Bowdoin; M.S., University of Maine). Bay Village, Ohio

Hattler, Brack G., Jr. (A.B., Duke University; M.D., Cornell University). Durham, North Carolina

Hill, Gale (B.S., Florida State University). Raleigh, North Carolina

Lucas, David O. (B.A., Duke University). Orange, California Parsons, Sarah J. (A.B., Valparaiso University). Valparaiso, Indiana Plate, Janet M. (B.S., Jamestown College). Anamoose, North Dakota Wexler, Marjorie A. (B.A., William Smith College). Syracuse, New York

Department of Physics

Research Assistants

Ackerman, Clinton C. (B.A., University of Buffalo). Eggertsville, New York Alexander, Chester (B.S., Davidson College; M.S., Emory University). Burlington, North Carolina

Banks, Donald W. (B.A., Yale University). Garden City, New York

Chase, Roger P. (B.S., Marietta College). Columbus, Ohio

Ciftan, Mikael (B.Sc., Istanbul American College; M.Sc., Massachusetts Institute of

Technology). Durham, North Carolina

Cox, Bradley B. (B.S., University of Kentucky), Lancaster, Kentucky Deis, Daniel Wayne (B.S., Stanford University), San Jose, California Divadeenam, Mundrathi (B.S., M.Sc., Osmania University). Andhra, India

De Lucia, Frank C. (B.S., Iowa Wesleyan College). Mount Pleasant, Iowa Elwell, David L. (A.B., Amherst College). Newton, Pennsylvania

Haun, Larry C. (B.S., Randolph-Macon College). Strasburg, Virginia

Helminger, Paul A. (B.S., North Carolina State College). Morganton, North Carolina

Hogan, Edward (A.B., Cornell University). Arlington, Virginia

Hughes, William M. (A.B., La Salle College). Willow Grove, Pennsylvania

Jackel, George S. (B.S., Drexel Institute of Technology). Philadelphia, Pennsylvania Jarvis, John F. (B.S., University of Florida). West Palm Beach, Florida

Keyworth, George A. (B.S., Yale University). Gardner, Massachusetts Kronenfeld, Jerrold (B.S., Duke University). Durham, North Carolina

Lewis, Monty B. (B.S., West Virginia University). Charleston, West Virginia

Litcher, James (B.S., Loras College; M.S., Fordham University). Algona, Iowa

Liming, F. Glenn (A.B., Harvard University). Arlington, Virginia Lindstrom, Daniel (B.A., Carleton College). Ashland, Wisconsin

Lopez-Cepero, Arnold B. (B.S., Yale University). New Haven, Connecticut

Ma, Horace Z. (B.S., Southwestern University). Hong Kong, Free China

McKnight, J. Samuel (B.S.E.E., Duke University; M.S. in Engineering, Duke University). Belmont, North Carolina

Meier, Michael Mc. (B.S., St. Procopius College). Lombard, Illinois

Mohan, Radhe (B.Sc., Punjab University). Punjab, India

Moses, John D. (B.S., Georgia Institute of Technology). Georgetown, South Carolina

Nelson, William (B.S., Auburn University). Meridianville, Alabama

Oelfke, William C. (B.S., Stanford University). Houston, Texas

Pearson, Edwin F. (A.B., Yale University). Springfield, Illinois

Pineo, William F. (B.S., William and Mary College). Groton, Massachusetts

Polucci, Anthony J. (B.S., Massachusetts Institute of Technology). Durham, North Carolina

Ramm, Dietolf (B.A., Cornell University). Neptune, New Jersey

Rosenberg, Allan P. (B.S., Massachusetts Institute of Technology). Memphis, Tennessee

Smith, William M. (B.S., Oglethorpe College). Atlanta, Georgia

Snow, Thomas R. (B.S., Carnegie Institute of Technology). Indianapolis, Indiana Thomason, Richard S. (B.S., Louisiana State University). New Orleans, Louisiana Tuan, Shiang-Tai (B.S., National Taiwan University; M.A., Wesleyan University).
Taiwan, China

Webb, Virgil H. (B.S., M.S., University of Georgia). Athens, Georgia

Weller, Henry R. (B.S., Fairleigh-Dickinson University). East Rutherford, New Jersey

White, Clark Woody (B.S., Massachusetts Institute of Technology). Decatur, Georgia

Winnewisser, Gisbert (Vordiplom, Technical University of Karlsruhe; Diplom-Hauptprüfung, Technical University of Karlsruhe). Karlsruhe, West Germany

United States Steel Foundation Fellowship

Thompson, James R. (B.S., Davidson College). Charlotte, North Carolina

Department of Physiology

Life Insurance Medical Research Fund

Allen, David W. (A.B., Duke University). Tampa, Florida Hoffman, Philip G. (B.A., Rice University). Houston, Texas

American Cancer Society

Rogol, Alan D. (S.B., Massachusetts Institute of Technology). Seymour, Connecticut

Vocational Rehabilitation Administration Traineeship Award

Monahan, Marcia S. (A.B., Kansas State University). Manhattan, Kansas

U.S. Public Health Service Traineeships

Butler, Keith W. (B.S.A., Ontario Agriculture School). Ontario, Canada Engel, Peter A. (B.A., Dartmouth College). Rochester, New York Green, James E. (A.B., Duke University). Hapeville, Georgia Hersey, Stephen J. (A.B., Cornell University). Ithaca, New York Kamlet, Kenneth S. (B.S., The City College of New York). Bronx, New York Nutting, David F. (A.B., Brown University). Abington, Pennsylvania Redmond, Audrey F. (B.A., Wellesley College). New Canaan, Connecticut Rosenthal, Myron (B.S., Trinity College). Storrs, Connecticut Schneider, Martin F. (B.S., Yale University). East Rockaway, New York Shepherd, Richard N. (B.A., Johns Hopkins University). Baltimore, Maryland Weiss, Harvey R. (B.S., The City College of New York). Bronx, New York Wexler, John P. (B.S., Hobart College). Durham, North Carolina

U.S. Public Health Service Predoctoral Fellowships

Owens, Ida S. (B.A., North Carolina College). Durham, North Carolina Pooler, John P. (A.B., Brown University). Weston, Massachusetts

Political Science

The Asia Foundation

Husain, Asrar (A.B., Agra University; M.A., Panjal University). Chakwal, Pakistan

The East-West Center: International Development Fellowship

Rahman, Abu Tayeb Rafiqur (A.B., M.A., Dacca University; M.P.A., University of Karachi). Ashrafpur, Pakistan

Fulbright Fellowship (Ceylon)

Gamelin, Timothy Robert (A.B., Gustavus Adolphus College; M.A., Duke University). Leonia, New Jersey

The Government of Pakistan

Hoque, Abu Nasar Shamsul (A.B., M.A., Dacca University; LL.B., Dacca University). Barisal, Pakistan

Department of Psychology

U. S. Public Health Service Predoctoral Fellows

Biller, Henry B. (A.B., Brown University). Durham, North Carolina Cox, Gary B. (B.S., University of Oregon). Salem, Oregon Delse, Frederick C. (B.S., Massachusetts Institute of Technology). Cleveland, Ohio Doetsch, Gernot S. (A.B., DePauw University). Tullahoma, Tennessee Hall, William C. (B.A., Duke University). St. Louis, Missouri Jay, Judith R. (B.A., Carleton College; M.A., Brown University). St. Paul, Minnesota Miller, Lyle H. (A.B., Drake University). Des Moines, Iowa Nelson, Linda M. (B.A., Syracuse University). Trumball, Connecticut Shows, William D. (A.B., A.M., University of Illinois). Durham, North Carolina Waszak, Michael (Vordiplom, University of Marburg). Marburg, Germany Wicklund, Robert A. (B.S., University of Washington). Seattle, Washington

U. S. Public Health Service Traineeships—Clinical Psychology

Barbour, George W. (B.S., University of Pittsburgh). Pittsburgh, Pennsylvania Cook, David A. (A.B., Oberlin College). San Diego, California Edquist, Manuel H. (B.A., Rice University). Amarillo, Texas Ginsburg, Ronald O. (B.S., Brooklyn College). Brooklyn, New York Greenfield, Jay R. (A.B., Harvard University). New York, New York Gutman, Virginia A. (B.A., Stetson University). Pompano Beach, Florida Hackney, David L. (B.A., Vanderbilt University). Daytona Beach, Florida Kronberg, Charles L. (B.A., Brooklyn College). Brooklyn, New York Riddle, Dorothy I. (B.A., University of Colorado). Boulder, Colorado Sellwood, Richard M. (B.S., Yale University). Stonington, Connecticut Shapiro, Kenneth J. (B.A., Harvard University). Boston, Massachusetts

Sherwood, David W. (A.B., Wittenberg University). Rochester, New York Small, James F. (A.B., Princeton University). Louisville, Kentucky Sprague, Rick E. (A.B., Stanford University). Lewiston, Idaho Webbink, Patricia G. (A.B., Connecticut College). Manhattan, New York

U. S. Public Health Service Traineeships—Social Psychology

Cooper, Joel (B.A., City College of New York). New York, New York Downing, Jerry N. (B.A., University of Oklahoma). Chickasha, Oklahoma Goethals, George R. (B.A., Harvard University). Winchester, Massachusetts Jaeger, Barry H. (B.A., New York University). New York, New York Ward, Lawrence M. (A.B., Harvard University). Indiana, Pennsylvania

U. S. Public Health Service Traineeships—Physiological Psychology

Ganchrow, Donald (B.S., M.A., Brooklyn College). Brooklyn, New York Hausner, Anthony (B.S., Carnegie Institute of Technology). Reading, Pennsylvania Monahan, John S. (A.B., University of North Carolina). Chapel Hill, North Carolina Schaub, George R. (B.S., Boston University; M.S., Trinity University). Boston, Massachusetts

Schuman, Marjorie C. (B.A., University of Michigan). New York, New York Snyder, Marvin (A.B., Brooklyn College). Brooklyn, New York Stolte, Susan L. (A.B., Syracuse University). LaGrange, Illinois

Veterans Administration Traineeships

Boyarsky, Rose E. (B.S., University of Vermont; M.A., Columbia University).

Durham, North Carolina

Dawson, Claudius S. (B.S., University of North Carolina; M.B.A., Harvard Business School; M.A., American University). Charleston, South Carolina
Farley, Gail G. (A.B., University of Pennsylvania). Northport, New York
Goldman, Terry (B.A., University of California). Westport, Connecticut
Hewett, Barbara B. (B.A., Duke University). High Point, North Carolina
Rogers, Judith L. (A.B., Western Kentucky State College). Fayetteville, North
Carolina

Aging and Human Development Trainees

Ganung, Cynthia A. (B.A., Swarthmore College). Orange, Connecticut
 Mancusi, Joseph L. (B.S., Iona College; M.S., Iowa State College). New Rochelle,
 New York
 Morris, Robert L. (B.S., University of Pittsburgh). Oakdale, Pennsylvania

Research Assistants

Feather, Sara (B.A., College of Wooster). Durham, North Carolina Hammock, Thomas E. (B.A., University of Florida). Orlando, Florida Maselli, Mary D. (B.A., Carleton College). Morton Grove, Illinois Morris, Joanna DuBarry (B.A., Swarthmore College). Mamaroneck, New York Ominsky, Mark (A.B., University of Pennsylvania). Philadelphia, Pennsylvania Posnick, Gregory M. (B.A., Queen's University). Laurelton, New York Seder, Isaac P. (A.B., Oberlin College). Pittsburgh, Pennsylvania

Sensenig, John (B.S., M.S., North Texas State University). Chapel Hill, North Carolina

Shaver, Kelly G. (B.S., M.S., University of Washington). Seattle, Washington Wells, David T. (B.A., Duke University). Laurel Bay, South Carolina

Department of Religion

Arthur N. Morris Foundation

Bedell, George C. (B.A., University of the South; B.D., Virginia Thelogical Seminary). Tallahassee, Florida

Raymond T. Stamm Fellowship (Lutheran Seminary, Gettysburg)

Cain, Marvin F. (B.S., Washington State University; B.D., Lutheran Theological Seminary). Richmond, Virginia

Rockefeller Doctoral Fellowships

Lord, James R. (B.A., Presbyterian College; B.D., Princeton Theological Seminary; Th.M., Duke Divinity School). Albany, Georgia

Ray, Roger D. (B.A., Baylor University; B.D., Southern Baptist Theological Seminary). Corsicana, Texas

Research Assistants, New Testament Text Project

Moretz, Rufus L. (B.A., Lenoir Rhyne College; B.D., Lutheran Southern Seminary).
Bradenton, Florida

Sharpe, John L. (B.A., Wofford College; B.D., Duke Divinity School). Blythewood, South Carolina

Instructorships, Undergraduate Department of Religion

Lord, James R. (A.B., Presbyterian College; B.D., Princeton Theological Seminary; Th.M., Duke Divinity School). Albany, Georgia

Stines, James W. (B.A., Wake Forest College; B.D., Southern Baptist Seminary). Durham, North Carolina

Readers, Divinity School

Charlesworth, James H. (B.S., Ohio Wesleyan University; B.D., Duke University). Ponte Vedra, Florida

Meeks, M. Douglas (B.A., Southwestern at Memphis; B.D., Duke Divinity School). Memphis, Tennessee

Ray, Roger D. (B.A., Baylor University; B.D., Southern Baptist Theological Seminary). Corsicana, Texas

Ridenhour, Thomas E. (B.A., Davidson College; B.D., Lutheran Theological Southern Seminary). Concord, North Carolina

Teaching Assistantships, Divinity School

Goodman, William R., Jr. (B.A., Washington and Lee University; B.D., Union Theological Seminary, Virginia). Lexington, Virginia

Meeks, Douglas M. (B.A., Southwestern at Memphis; B.D., Duke Divinity School). Memphis, Tennessee

Page, Allen F. (B.A., Wake Forest College; B.D., Union Theological Seminary, New York). Morrisville, North Carolina

Instructors, Divinity School

Rice, Charles L. (B.A., Baylor University; B.D., Southern Seminary; S.T.M., Union Theological Seminary, New York). Costa, Mesa, California

Rogers, Charles A. (B.A., Southwestern University; B.D., S.T.M., Perkins School of Theology). San Antonio, Texas

Department of Sociology and Anthropology

U. S. Public Health Service Predoctoral Traineeships

Suter, Larry E. (B.A., The College of Idaho). Wilder, Idaho

Blair, Jeffrey H. (M.S., Kansas State College). Parsons, Kansas
Barringer, Leland D. (B.A., Michigan State University). Lathrup Village, Michigan
Boyd, Monica (A.B., University of Chicago). Oak Ridge, Tennessee
Bromley, David G. (M.A., Duke University). Reading, Massachusetts
Crowder, Norville D. (B.A., Vanderbilt University). Birmingham, Alabama
Drass, Belinda A. (M.A., Northwestern University). Chapel Hill, North Carolina
Fetzer, Charles H. (A.B., Lenoir Rhyne College). Shelby, North Carolina
Harris, Charles S. (M.A., Duke University). Syracuse, New York
Hollerbach, Paula E. (A.B., Cornell University). Cranford, New Iersey

Research Assistants

Applebaum, Gerald M. (B.A., University of Toronto). Toronto, Ontario, Canada Jarmon, Charles (M.A., North Carolina College at Durham). Durham, North Carolina

Wilson, Stephen R. (M.A., Kent State University). Fremont, Ohio

Department of Zoology

National Institutes of Health Physiology Traineeships

Bretz, William L. (B.A., Pomona College). Columbia, Missouri Gosline, John M. (B.A., University of California at Berkeley). Oakland, California Vaughan, Jerry L. (B.S., Southwestern of Memphis). Memphis, Tennessee Watson, John M. (B.S., Grove City College). Sharon, Pennsylvania Dalbey, Walden E. (A.B., DePauw University). Wooster, Ohio

U. S. Fish and Wildlife Fellowships

Culliney, John (B.A., Yale University). North Haven, Connecticut Gentleman, Susan B. (B.A., Swarthmore College; M.S., University of Illinois). Louisville, Kentucky

National Institutes of Health Calcification Trainee

Neff, Jerry M. (A.B., Antioch College). Cohasset, Massachusetts

Research Assistant

Collings, Suzanne (B.S., University of Tennessee). Knoxville, Tennessee

National Research Council (of Canada) Special Fellowship

Mantuani, Mark A. (B.Sc., University of Toronto). Toronto, Ontario, Canada

Physical Therapy

Vocational Rehabilitation Administration Traineeship

Monahan, Marcia S. (B.A., Kansas State University). Manhattan, Kansas

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BULLETIN OF DUKE UNIVERSITY

The School of Forestry 1967



Annual Bulletins

For Bulletin of Information for Prospective Students, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The School of Engineering, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to The Dean of the Divinity School, Duke University, Durham, N. C.

For Bulletin of The School of Forestry, apply to The Dean of the School of Forestry, Duke University, Durham, N. C.

For Bulletin of The Graduate School of Arts and Sciences, apply to The Dean of the Graduate School, Duke University, Durham, N. C.

For Bulletin of The School of Law, apply to The Dean of the School of Law, Duke University, Durham, N. C.

For Bulletin of The School of Medicine, apply to The Dean of the School of Medicine, Duke University, Durham, N. C.

For Bulletin of The School of Nursing, apply to The Dean of the School of Nursing, Duke University, Durham, N. C.

For Bulletin of The Summer Session, apply to The Director of the Summer Session, Duke University, Durham, N. C.

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BULLETIN OF DUKE UNIVERSITY

The School of Forestry 1967



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School of Forestry Calendar

1967

August

5 Saturday—Educational Testing Service examinations in French, German, and Russian; 9:00 A.M., Room 125 Engineering Building. Students planning to take one of these examinations must register on or before July 5 with the University's Counseling Service, Room 300 Flowers Building.

September

18 Monday—Reading, vocabulary, and grammar tests in French, German, and Spanish. French and Spanish tests 9:00 A.M., German tests 10:15 A.M. All tests in Room 111 Biological Sciences Building

18–19 Conference period for new students entering doctoral programs 19 Tuesday—Registration of all new students who have not pre-

registered

20 Wednesday-Final registration of all pre-registered students

21 Thursday-Instruction begins in the School of Forestry

Monday—French and Spanish examinations for candidates for graduate degrees; 4:00 P.M., Room 229 Allen Building. Candidates register for these examinations in the Graduate School Office on or before October 1

October

28 Saturday—Educational Testing Service examinations in French, German, and Russian; 9:00 A.M. Students planning to take one of these examinations must register with the University's Counseling Service, Room 309 Flowers Building, through September 26

November

Wednesday—English examination for foreign students; 3:30 P.M., Room 402 Allen Building. Students required to take this examination should register in the Graduate School Office through November 9

Wednesday-Thanksgiving recess begins at 12:30 P.M. 22

Monday-Classes are resumed beginning at 8:10 A.M. 27

December

Monday-Founder's Day 11

Wednesday-Christmas recess begins at 12:30 P.M. 20

1968

January

Wednesday-Christmas recess ends. Classes are resumed begin-3

ning at 8:10 A.M.

Tuesday-French and Spanish examinations for candidates for 9 graduate degrees, 4:00 P.M., Room 229 Allen Building. Candidates register for these examinations in the Graduate School Office on or before December 17, 1967

Saturday-Fall semester classes end at 12:30 P.M. 13

Wednesday-Mid-year examinations in the School of Forestry 17 begin

Friday-Mid-year examinations in the School of Forestry end 26

Monday-Reading, vocabulary, and grammar tests in French, 29 Spanish, and German for students entering in the second semester. French and Spanish tests, 10:30 A.M., German tests, 11:45 A.M. All tests in Room 125 Engineering Building.

Tuesday-Matriculation and registration of new students 30

Wednesday-Last day for matriculation for the spring semester 31

February

Thursday-Spring semester classes begin 1

Saturday-Educational Testing Service examinations in French, German and Russian; 9:00 A.M. Students planning to take one of these examinations must register with the University's Counseling Service, Room 309 Flowers Building, through January 3

March

Saturday-Spring recess begins at 12:30 P.M. Spring field trips 23

April

Monday-Classes are resumed at 8:10 A.M.

Monday-French and Spanish examinations for candidates for 8 graduate degrees, 4:00 P.M.; 229 Allen Building. Candidates register for these examinations in the Graduate School Office not later than March 22

Saturday-Educational Testing Service examinations in French, 20 German and Russian; 9:00 A.M. Students planning to take one of these examinations must register with the University's Counseling Service, Room 309 Flowers Building, through March 19

15 Monday—Last day for submitting Doctor of Forestry and/or Doctor of Philosophy dissertations

May

- 15 Wednesday-Last day for submitting Master of Forestry theses
- 16 Thursday-Spring classes end at 5:00 P.M.
- 20 Monday-Final examinations begin
- 29 Wednesday-Final examinations end

June

- 1 Saturday—Commencement begins2 Sunday—Commencement sermon
- 3 Monday-Commencement address and graduating exercises

Administration

General Administration

Douglas Maitland Knight, Ph.D., Litt.D., LL.D., L.H.D., President of the University

R. Taylor Cole, Ph.D., Provost

Frank Leon Ashmore, A.B., Vice President for Institutional Advancement Gerhard Chester Henricksen, M.A., C.P.A., Vice President and Treasurer Everett Harold Hopkins, LL.D., Vice President for University Planning and Institutional Studies, Assistant Provost

Charles B. Huestis, Vice President for Business and Finance

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Harold W. Lewis, Ph.D., Vice Provost

Richard Lionel Predmore, D.M.L., Vice Provost

Barnes Woodhall, M.D., Vice Provost

Craufurd David Goodwin, Ph.D., Assistant Provost

Robert H. Ballantyne, Ed.D., Assistant to the President for Planning

Benjamin Edward Powell, Ph.D., Librarian

Richard Lovejoy Tuthill, Ed.D., University Registrar

Rufus H. Powell, LL.B., Secretary of the University

Edwin Constant Bryson, LL.B., University Counsel

School of Forestry Administration

Ellwood Scott Harrar, M.S., Ph.D., Sc.D., Dean of the School of Forestry Fred Myerle White, M.F., Director of the Duke Forest, Assistant to the Dean

Leon Edward Chaiken, M.F., Director of Admissions

James Gibson Yoho, M.F., Ph.D., Director of Graduate Studies in the Department of Forestry of the Graduate School

School of Forestry Faculty and Staff

Roger Fabian Anderson (1951), M.S., Ph.D., Professor of Forest Entomology—2528 Perkins Road

Robert Lloyd Barnes (1965), M.F., Ph.D., Professor of Forest Bio-

chemistry—5303 Revere Road

Melvin Ole Braaten (1965), M.S., Ph.D., Assistant Professor of Forest Biometry-3111 Sherbon Drive

Leon Edward Chaiken (1952), M.F., Professor of Forest Management— 2737 Dogwood Road

Ellwood Scott Harrar (1936), M.S., Ph.D., Sc.D., Professor of Wood Science—2228 Cranford Road

Kenneth Richard Knoerr (1961), M.F., Ph.D., Associate Professor of Forest Climatology—4429 Ryan Street

Paul Jackson Kramer (1931), M.Sc., Ph.D., James B. Duke Professor of Botany—2251 Cranford Road

James Granville Osborne (1961), B.S., Professor of Forest Biometry—2756 McDowell Street

Charles William Ralston (1953), M.F., Ph.D., Professor of Forest Soils—2531 Wrightwood Avenue

William James Stambaugh (1961), M.S., Ph.D., Associate Professor of Forest Pathology—3211 Sherbon Drive

John Dennis Sullivan (1959), M.S., Ph.D., Associate Professor of Wood Science—2710 McDowell Street

Albert Edward Wackerman (1938), M.F., Professor of Forest Utilization—3610 Dover Road, Hope Valley

Fred Myerle White (1959), M.F., Assistant Professor of Silviculture—3323 Rolling Hills Road

Frank Wilson Woods (1958), M.S., Ph.D., Associate Professor of Forest Ecology-1509 Pinecrest Road

James Gibson Yoho (1957), M.F., Ph.D., Professor of Forest Economics—2522 Sevier Street

Associate Faculty

Donald J. Fluke, Ph.D., Professor of Zoology Frederick C. Joerg, M.B.A., Professor of Economics Aubrey W. Naylor, Ph.D., Professor of Botany Joseph J. Spengler, Ph.D., James B. Duke Professor of Economics

Adjunct Faculty (Forest Sciences Laboratory of the Southeastern Forest Experiment Station)

Edgar William Clark, Ph.D., Adjunct Associate Professor of Forest Entomology—Route 1, Box 474, Cary, N. C.

Charles Sasnette Hodges, Jr., M.F., Ph.D., Adjunct Associate Professor of Forest Pathology—505 Pleasants Avenue, Cary, N. C.

Louis John Metz, M.F., Ph.D., Adjunct Associate Professor of Forest Soils

-203 Waldo Street, Cary, N. C.

Staff

Mrs. Patricia S. Rorie, Recorder and Secretary to the Dean-3313 Highland Avenue

William H. Sites, M.F., Superintendent, Duke Forest-Route 1, Box 5 Rigsbee Road

Mrs. Edwina Johnson, B.S. in L.S., Librarian, Forestry-Biology-1606 Peace Street

Mrs. Donna H. Squires, Secretary—Route 2, Box 339A, Chapel Hill, N. C. Mrs. Sue P. Woods, Secretary, Duke Forest, and Statistical Clerk—501 E. Lavender Street

Mrs. Jo W. Russell, Secretary—1409 Rosedale Avenue Miss Joanne Wheeler, Secretary—1611 Lathrop Street

Faculty Emeriti

Clarence Ferdinand Korstian, M.F., Ph.D., Professor Emeritus of Silviculture, Dean Emeritus of the School of Forestry-4 Sylvan Road

Francis Xavier Schumacher, B.S., D.Sc., Professor Emeritus of Forestry—Route 1, Box 106B Lakeside Drive

Frederick Adolphus Wolf, Ph.D., James B. Duke Professor Emeritus of Botany-924 Urban Avenue



General Information

Duke and the School of Forestry

Duke University, located at Durham, North Carolina, comprises Trinity College, the Woman's College, the College of Engineering, the Graduate School of Arts and Sciences, and the professional schools of Forestry, Divinity, Law, Medicine, and Nursing. The University dates from 1838, when Union Institute was founded in Randolph County by the Methodists and Friends. In 1851 the institution became Normal College, one of the first schools in America for the training of teachers. In 1859 the name was changed to Trinity College and so continued until 1924, when the College became a part of Duke University.

By virtue of an indenture of trust, executed December 11, 1924, by James Buchanan Duke, a great benefaction was placed at the disposal of humanity by providing for hospitalization, church work in rural communities, and education. The principal feature of the educational pro-

vision was the creation of Duke University.

The University, with a student body of over 7,000, occupies two campuses. The Woman's College campus of 108 acres was formerly the campus of Trinity College. About a mile west are the newer units of the University, known as the West Campus, totaling 467 acres. It was first occupied in September, 1930.

Forestry at Duke University began early in 1931 when the Duke Forest was placed under intensive forest management and forestry research was initiated. An academic-forestry curriculum, designed for men and women intent upon pursuing the study of forestry as a profession, was organized in Trinity College of Duke University in 1932. This program was enlarged in 1952 and now includes more than 60 cooperating colleges and universities. (See pages 17-21).

In 1938 the School of Forestry was organized at the graduate level and a curriculum was offered leading to the degree Master of Forestry. Work leading to the degree of Doctor of Forestry has been offered since 1940. The School has been fully accredited since its origin. A degree in forestry at the undergraduate level is not offered at Duke University.

Graduates of recognized colleges and universities, and professional schools of forestry, and other students who meet the entrance requirements f the School (see page 30), may enroll for training in forestry leading to the professional degrees, Master of Forestry and Doctor of Forestry. The Department of Forestry in the Graduate School of Arts and Sciences also offers graduate work in certain aspects of forestry leading to the degrees Master of Science and Doctor of Philosophy. This work is available to graduates of schools of forestry of recognized standing, and to college or university graduates holding a Bachelor's degree.

Students taking undergraduate work and who are planning to matriculate in the School for programs of study leading to the degrees Master of Forestry or Doctor of Forestry should refer to the section in this announcement (page 30) where entrance requirements are presented.

Courses of Study and Requirements for Degrees

Master of Forestry Degree

The requirements for the degree of Master of Forestry (M.F.) are governed by the extent of the student's previous professional training. Normally, students who have earned the degree of Bachelor of Science in Forestry, or equivalent, from an accredited school of forestry may complete the requirements for the M.F. degree in one academic year. Students who have had no prior professional training in forestry are required to complete five semesters of resident study. Graduate work of equivalent grade done in residence at other institutions may, with the approval of the Faculty, be accepted as credit toward the degree, but a minimum of one year of residence at Duke University is required.

The submission of a thesis for the M.F. degree usually is required. With the approval of the Faculty, an acceptable report on a special study may be submitted in lieu of a thesis, credit for which will not exceed three semester hours. Four copies of the thesis, typewritten and bound in accordance with regulations set forth by the Faculty, must be deposited with the Dean of the School of Forestry on or before May 15 of the academic year in which the student expects to obtain the M.F. degree.

A student who has not completed his thesis while in residence must

submit an acceptable manuscript to the faculty within a period of two years following the termination of his residence.

No student may take less than fourteen nor more than eighteen semester hours of credit per semester without special permission of the Faculty.

Post-Professional Program

Students with satisfactory undergraduate professional training qualify for advanced study and research in the various disciplines of forestry under this program. A specific study plan is developed for each student through consultation with a faculty advisory committee. For the student planning a managerial career in the general area of forest production or in forest products technology (and where the Master of Forestry is planned as a terminal degree), these study plans usually consist of courses and seminars with a major portion of the work concentrated in the areas of the student's interests. For the student with research interest, the study plan is oriented within the subject matter field of interest toward the furtherance of a research career, or toward preparing him for academic training beyond the master's level.

A number of senior-graduate courses offered in other departments of the University (see pages 49-53) are open to qualified students in the School of Forestry. One or more of these may be included in a student's

study plan when deemed advisable by his advisory committee.

A minimum of thirty semester credit hours, in which the student must earn a grade of E or G in at least six hours, are required for the degree, Master of Forestry, under this program. Normally, 15 hours of credit (including thesis) must be earned in the School of Forestry.

Post-Liberal Arts and Science Program

Men and women who are college graduates but also have had no prior professional training are admitted to programs of study leading to the attainment of the degree, Master of Forestry. A minimum of five semesters of work in residence is usually required including the core courses listed below.

CORE COURSES

	S.H.
Forest-tree physiology (For. 201)	3
Forest soils (For. 261)	3
Resource Economics and Policy (For. 269)	3
Identification of American Trees and Their Timbers (For. 249)	4
Forest Meterology (For. 203)	3

Forest Ecology (For. 243)	9
Computer Programming (For. 253)	1
Forest Biometry (For. 250)	3

During the latter part of the first semester of the first year each student will be requested to designate the subject matter field (or fields) he wishes to pursue for a major. Those who successfully complete the work of the first semester will be assigned a faculty advisor who, in consultation with the student, will develop a program of study in a manner similar to that described under the Post-Professional Program (see page 4).

Any student who does not earn a grade of E or G in at least six hours of work in the first academic year will not be permitted to enter into the

work of the second year.

Business Management Program

A specialized program is offered in the School of Forestry, in cooperation with the Department of Economics and Business Administration to prepare forestry graduates for managerial careers in the business aspects of industrial forest land management or forest products. The program requires two years of study and training leading to the degree Master of Forestry. It is open to selected students who have earned a Bachelor's Degree in general forestry, forest management, forest utilization, or wood science and technology, and who have potential leadership qualities indicative of administrative and executive capacity.

The general requirements of the program are as follows:

1. At least 10 courses (30 semester hours) in economics and business administration or in closely allied fields.

2. Approximately five courses (15 semester hours) in forestry which

deal with principles of administration and decision-making.

3. Experience as a paid managerial trainee with a cooperating firm for a period embracing the included summer and fall semester of the second year.

4. A written analysis of some phase of the managerial operation of the

organization with which the training period is spent.

A specific program of study, commensurate with each student's academic background and future goals, will be developed by the program Advisory Committee in consultation with the student. A sample list of suggested courses included in such a program of study is available on request.

Students entering this program must meet the admission requirements of the School of Forestry and be approved by a committee representing the faculties of Economics and Forestry. The financial award benefits of the School of Forestry are available to applicants for this program (see pages 34-36). Application forms for admission and financial aid may be obtained from the Director of Admissions of the School of Forestry upon request.

Master of Science Degree

Prerequisites

The degree Master of Science is offered through the Department of Forestry in the Graduate School of Arts and Sciences in the basic and applied science areas of Forestry. As prerequisites to this degree a student must have earned a baccalaureate degree from an accredited college or university and have completed a minimum of 12 semester hours of work in the major field. There is no foreign language requirement for this degree.

Major and Minor Subjects

The work for the Master of Science degree is designed to provide a broad foundation in the basic and applied sciences applicable to forestry. The student must present acceptable grades for a minimum of 24 units of graduate courses; at least 12 in course work in his major area of concentration (but not necessarily confined to the offerings of the Department of Forestry); a minimum of six units in a minor subject which lends support to his program; and the remaining six of the 24-unit course requirement in either the major or minor subject, or in an area approved by his committee. In addition to the 24-unit course requirement the student must present a thesis which carries a credit of six units.

The Thesis

Filing the Thesis Title. At least one month before presenting the thesis, that is on or hefore March 1 for a June degree or on or before July 1 for a September degree, the student must file with the Dean of the Graduate School, on the official form, the title of the thesis and declaration of intention to graduate. The title must have the approval of the Director of Graduate Studies in the major department, and of the thesis supervisor. Preparing the Thesis. All basic requirements for preparing the thesis are described in the Manual of Style for Theses and Dissertations, revised 1961, obtained at the Duke University Book Store, West Campus. The quality of paper, form, and binding are prescribed in the Manual.

Submitting the Thesis

Four typewritten copies of the thesis bound in snap binders supplied by the Library must be submitted in approved form to the Dean of the Graduate School on or before May 1 for a June degree or August 15 for a September degree and at least three days before the scheduled date of the student's examination. The copies will then be distributed to the several members of the examining committee. Two copies for the Library will be bound by the Ruzicka Bindery, fee \$5.00 a volume. The student will state whether or not he wishes more than two so bound.

The Examining Committee and the Examination

The instructor who directs the thesis appoints an examining committee composed of the supervisor of the thesis and two other members of the Graduate Faculty, one of whom must be from a department other than that of the major. If the student has been permitted to take related work within the major department, the third member may represent the minor field within the department. This committee is submitted for approval to the Dean of the Graduate School when the thesis is first presented.

The candidate appears before this committee for an examination which lasts for about one and one-half hours. The subject matter covered in the examination is usually restricted to the thesis and to the major field.

If the candidate passes his examination, the examining committee certifies this fact by signing the title page of all copies of the thesis. The candidate then returns the original, the first carbon copy of the thesis, and any others he wishes bound by Ruzicka, to the Dean of the Graduate School, who deposits them in the University Library.

Doctor of Forestry Degree

The degree Doctor of Forestry (D.F.) is a professional and research degree conferred on those students who have satisfactorily completed

specified requirements of advanced study and research.

Work toward the D.F. degree, consisting of advanced studies in a major and a minor field, is offered with majors in the several branches of forestry. A minor may also be elected in forestry or in other areas of specialized study in the University approved by the faculty of the School of Forestry. Prospective students should correspond with the Director of Admission of the School of Forestry on all matters pertaining to admission to the School.

Program of Study

A committee consisting of at least four members, including a major

advisor, will be appointed by the Dean to supervise the work of each

student. The major advisor will serve as Committee Chairman.

The advisory committee, in consultation with the student, will prepare a proposed program of study and research. If in the judgment of the Committee the student's prior training is inadequate, he may be required to remedy such deficiencies by taking certain undergraduate courses as prerequisites to continued graduate study, but which will carry no graduate credit.

The program will consist of courses, seminars, arranged work, and research, approved for graduate credit by the faculty of the School of Forestry. Satisfactory completion of a minimum of 30 semester hours of formalized academic work in which the student must attain a grade of E or G in at least nine hours is required of all prospective candidates. Credit hour requirements for the major and minor fields are determined by the Committee. The student's program of study necessarily demands substantial concentration on courses in his major department. A minor, if elected, will consist of at least 12 semester hours, part or all of which may have been included in the program for the Master's degree. If a minor is not elected, a minimum of six semester hours in a single subject matter area outside the major field must be included in the program of study.

Foreign Language Requirements

Because a requirement for a doctoral degree is the mastery of two acceptable foreign languages, the prospective graduate student should attain mastery of at least one of them, and preferably two before applying for admission.

The facilities for graduate study are highly specialized and costly. The student who must lay them aside to acquire what he could have learned

as an undergraduate is wasting his time.

To prevent delay in meeting this requirement, students whose programs call for mastery of French, Spanish, or German and who have studied the language must take the objective screening examination at their first registration period.

Acceptable Languages

The languages normally required are French, German, and Russian, but a student may substitute for any one of these another language which has a definite relation to the candidate's program of work for the degree and for which an examination can be provided.

Meeting the Requirements

At least one of the language requirements must be met during or before the student's first regularly enrolled semester at Duke. Students not able to comply with this regulation will be required to reduce their maximum allowable load in succeeding semesters by 3 semester hours until the first language requirement has been met. The second requirement must be met before the student is permitted to take his comprehensive preliminary examination. Enrollment in non-credit language courses will be considered a part of the student's maximum allowable load in any one semester.

Language requirements may be met before, during, or after first registration here in the following ways:

Before First Registration

- 1. By Transcript. With the permission of the Dean and of the chairman of his program committee, the doctoral student may file a transcript or other certification as evidence of having passed a comparable examination at another graduate institution. The limitations are that (1) only one of the two doctoral requirements may be met in this way, (2) the other institution offers a doctoral program in the student's major and that the examination would have met a doctoral requirement there, and (3) the examination was passed no more than five years before first registration here.
- 2. By ETS Scores. The Educational Testing Service Graduate School Foreign Language tests in French, German, and Russian are offered at many centers including Duke University Counseling Center upon nationally uniform dates. Scores on these tests taken elsewhere not more than five years before first registration here may be offered to meet the language requirement.

At First Registration

On Monday of the fall registration period and on the day before spring registration, objective reading, grammar, and vocabulary tests in French, German, and Spanish are offered (see the Calendar for hour and place). Any entering student in a doctoral program may take them. On the basis of his scores the student will be (1) certified as meeting requirements in these languages, (2) advised after review to present himself for the ETS tests (French, German) or the locally-prepared reading test in Spanish. or (3) advised to enroll in the special reading course (see below).

After First Registration

1. Students who first registered in September, 1964, and thereafter, and who wish to be examined in French, German, or Russian will take the ETS tests. For Spanish they will take the locally-prepared reading test.

2. Students who began a program before September, 1964, may take either the ETS test or the locally prepared reading tests in French, Ger-

man, Russian, Spanish, and, upon request, Italian.

Reading examinations in other languages must be individually arranged. Each ETS examination requires a fee of \$8. The student who requires a re-examination in the locally prepared reading examination at scheduled times will be charged \$5 for each re-examination; if special times are necessary, the fee will be \$10. Examinations at special times cannot be offered in French and Spanish.

Special Reading Courses

Special courses designed to assist graduate students in acquiring a reading knowledge of French or German are offered for three hours a week, French during the fall semester, German during the spring semester and the Summer Session. A student who registers for either course must reduce his normal load of graduate courses by three units, with no reduction in fees. No auditors are permitted in these courses at any time.

Requirements for Foreign Students

Foreign students whose native language is not English are, during their first registration period, required to take a test for minimum competence in English. Such students, with the approval of the Director of Graduate Studies in their major department, may request substitution of English for one of the required foreign languages in the doctoral program. If permission is granted, an additional reading test in English will be arranged.

Comprehensive Examination

At least six months before the student expects to receive the D.F. degree, and after he has completed most of his formal course work, he will be required to take a comprehensive examination. The examination will be written in subject areas specified by the Committee and may be followed by an oral examination given by the Committee. The decision as to whether the examination has been passed or failed is the responsibility of the Committee.

Privilege of Re-Examination. Should the student fail the comprehensive examination, he may apply, with the consent of his supervisory committee and of the Dean of the School of Forestry, for the privilege of a second examination to be taken no sooner than three months after the date of the first. Failure on the second examination will render the student ineligible to continue his program for the D.F. degree at Duke University.

Upon satisfactory completion of the comprehensive examination the

student will be considered a candidate for the D.F. degree.

Residence Requirements

The minimum period of study beyond the M.F. degree, or its equivalent, is two years of academic work of which at least two regular semesters must be spent in full-time study on the campus in Durham. Graduate work of a fragmentary nature taken over a period of several years will not meet this requirement. Course work of equal grade taken at another college or university of approved standing may, with approval of the Faculty of the School of Forestry, be accepted in partial fulfillment, but shall not exceed 15 semester hours of the total requirements. Such transfer of credit may not under any circumstances be used to reduce the two regular semesters of full-time study which must be spent at Duke University. Course work taken under the cooperative interchange-ofregistration plan between the graduate schools of Duke University and the Consolidated University of North Carolina is considered the same as work taken on the campus in Durham.

A student who has successfully completed the 30 hours of required formalized study, met the language requirements, and passed the comprehensive examination may, with the approval of his supervisory committee and the Dean of the School of Forestry, continue his research and complete his dissertation in absentia. Under this arrangement he is required to register for one hour of research credit each semester until the

degree has been awarded.

A student who remains in residence after passing the preliminary examination must register for a minimum of three semester hours of research credit each semester unless his course-seminar registration is at least nine hours, in which case the 3-hour registration requirement is waived.

Dissertation

In addition to obtaining adequate training in the field of his specialty, the student must demonstrate his ability to plan and conduct sound, original research. Evidence of this accomplishment must be presented in the form of an acceptable dissertation embodying the results of original work, which is a definite contribution to knowledge. Course credit is not granted but students must register for dissertation research.

The subject of the dissertation must receive the approval of the Faculty, and the title must be filed with the Dcan of the School of Forestry on or before October 15 of the academic year in which the candidate

desires to take his final examination.

The dissertation will normally be submitted for acceptance within two calendar years after passing the preliminary examination. Should it not be submitted within four calendar years after the examination, the candidate may, with the approval of his committee, petition the Dean of the School of Forestry for an extension of one year.

If the dissertation is not submitted and accepted within five years after the examination, the candidate must pass a second preliminary examination. Following the second examination, the student's doctoral committee will determine possible additional requirements and set time limits within

which the dissertation must be completed and accepted.

After the dissertation has been approved by the major advisor, and at least 10 days prior to the date set for the final examination, the candidate is required to deposit with the Dean of the School of Forestry the original and three typewritten and temporarily bound copies together with 10 copies of an abstract of the dissertation consisting of not more than 600 words. Following acceptance of the dissertation by the Committee, the student will deposit with the Dean of the School of Forestry on or before April 15 of the academic year in which the student expects to obtain the D.F. degree the original unbound copy of the dissertation together with three carbon copies (also unbound) and 10 copies of the approved abstract. The first carbon copy will be deposited in the University Library; the major advisor will receive one copy; and the fourth copy will be returned to the student. The original copy will be sent to University Microfilms, Ann Arbor, Michigan, where it will be reproduced and published on microfilms. Later the original will be returned to Duke University where it will be bound and deposited in the University Library.

The basic requirements for preparing the dissertation are described in the Manual of Style for Theses and Dissertations which may be obtained from the Duke University Book Store, West Campus. Additional instructions concerning the microfilming and the preparation of title page and

abstract should be obtained from the Dean's office.

At the time the final approved copies of the dissertation and the abstract are deposited with the Dean of the School of Forestry, the candidate must show evidence of having paid a fee of \$25.00 to the Bursar of the University to cover the costs of microfilming.

Final Examination

The final examination will be in defense of the candidate's dissertation and on related subject matter. It will be oral and will be conducted by the advisory committee. At least six months must elapse between the dates of the preliminary and the final examinations.

Doctor of Philosophy Degree

The Doctor of Philosophy degree (Ph.D.) is conferred through the Graduate School of Arts and Sciences of Duke University. Programs of study and research for men and women working toward the attainment of this degree are directed by faculty members of the School of Forestry who also comprise the graduate faculty of the Department of Forestry in the Graduate School. Both major and minor programs of study are available in the following branches of forestry: forest biochemistry, forest biometry, forest climatology, forest ecology, forest economics, forest entomology, forest hydrology, forest pathology, forest soils, forest-tree physiology, and wood science including wood anatomy, timber physics, and wood chemistry.

The Ph.D. degree is essentially a research degree. Although course work is a necessary part of the student's program, the mere accumulation of course credits will not be sufficient for attaining this degree. The granting of the Ph.D. is based primarily upon the student's knowledge of a specialized field of study and upon the production of an acceptable dis-

sertation embodying the results of original research.

General Requirements

The formal requirements, discussed in detail below, for the Ph.D. degree are as follows: (1) foreign languages; (2) major and minor courses; (3) supervisory committee for program of study; (4) residence; (5) preliminary examination; (6) dissertation; (7) final examination. In order to be considered for candidacy for the Ph.D. degree, the student must have passed all of his course work in the first year of graduate study; on at least 9 units of course work he must have made a grade of G or better.

Foreign Languages

Normally, a reading knowledge of both French and German is required.

(For methods of meeting this requirement, see pp. 8-10.)

A student working toward the doctoral degree should complete the language requirements for that degree by the end of his first year of residence. If he fails to meet these requirements by the end of his third semester of residence, he must register in the appropriate special reading course or courses (see page 10) until he has satisfied the requirements.

Major or Minor

The student's program of study necessarily demands substantial concentration on courses in his major department. It must, however, include a minimum of six units in a minor subject or related fields approved by his major department. Use of related fields within the major department requires the approval of the Dean of the Graduate School.

Committee to Supervise the Program of Study

As early in a student's course of study as is practicable and not later than two months before the preliminary examination the Director of

Graduate Studies in the major department will nominate for the approval of the Dean a supervising committee of five, one being designated as chairman. This committee will include at least three members of the major department and one from the minor department if a minor is involved. This committee will draw up a program of study and administer the preliminary examination and, with such necessary changes as are approved, the final doctoral examination. However, should all members of the committee be from the major department, at least one member of another department will be added or substituted for the final doctoral examination. The final examination may be administered with a minimum of four members.

When the preliminary examination is arranged, the committee and the Director will submit to the Dean the student's program of study bearing a statement that the Department's course and language requirements have been or are being completed.

Residence

For students who first registered in September, 1959, or thereafter, the minimum registration requirement is 60 units of graduate credit not more than 30 units of which may be accepted by transfer. Since a full program is 30 units per academic year, the prospective Ph.D. candidate who enters with the A.B. or B.S. degree must plan to spend in residence a minimum of two academic years; if he enters with the A.M., M.S. or M.F., his minimum residence is one academic year. If there are undergraduate deficiencies in his program, he may in addition to the minimum requirements be required to take preliminary undergraduate courses for which he will not receive graduate credit. Even if there are no such undergraduate deficiencies, the student's supervisory committee will determine what requirements if any above the minimum the student must meet.

Time Limitations. 1) At the time that the preliminary examination is passed any courses, language certifications, or other credits for advanced standing which are more than six calendar years old will not be accepted toward fulfilling the minimum requirements of the doctoral degree.

2) The student should normally pass the preliminary examination by the end of his second year of graduate study. If he has not passed it by the middle of the third year, he must file with the Dean of the Graduate School a statement explaining the delay and setting a date for the examination. Except under unusual circumstances, extension will not be granted beyond the end of the third year.

3) The doctoral dissertation should be submitted and accepted within two calendar years after the preliminary examination is passed. Should the dissertation not be submitted and accepted within four years after the examination, the candidate, with the approval of his committee, may petition the Dean of the Graduate School for an extension of one year. Should this extension be granted and the dissertation not be submitted and accepted within the year, the student to remain a candidate for the degree must pass a second preliminary examination. In such a case, the time limit for submitting the dissertation will be determined by the Dean of the Graduate School and the candidate's committee.

Credit for Summer Work. Credit earned in the Summer Session will not reduce the minimum required residence (see above, p. 14).

Preliminary Examination

A student is not accepted as a candidate for the Ph.D. degree until he has passed the preliminary examination. A transfer student who may have passed a preliminary examination elsewhere must nevertheless take the examination in this Graduate School. The examination ordinarily covers both the major and minor fields.

Except in unusual circumstances approved by the Dean, a preliminary examination will not be scheduled between the last day of the spring semester examination period and registration day in the fall semester.

Privilege of Re-Examination. Should the student fail the preliminary examination, he may apply, with the consent of his supervisory committee and of the Dean of the Graduate School, for the privilege of a second examination to be taken no sooner than three months after the date of the first. Failure on the second examination will render the student ineligible to continue his program for the Ph.D. degree at Duke University.

The Dissertation

The dissertation is expected to be a mature and competent piece of

writing, embodying the results of significant and original research.

Filing Title. Not later than March 1 (March 2 if March 1 falls on Sunday) preceding the June commencement at which the degree is expected to be conferred, the student must file with the Dean of the Graduate School, on the official form to be obtained from the Graduate Office, the title of the dissertation. This title must receive the written approval of both the Director of Graduate Studies of the student's major department and the professor who directs the dissertation.

Form. The basic requirements for preparing the dissertation such as quality of paper, form, and binding are prescribed in the instructions for microfilming (see below) and in the Manual of Style for Theses and Dissertations, revised 1961, to be obtained from the Duke University Book

Store, West Campus.

Submitting Dissertation. The dissertation must be completed to the satisfaction of the instructor who directs it. Four typewritten copies bound in snap binders obtained in the Library must be deposited with the Dean of the Graduate School on or before April 15 preceding the June commencement when the degree is to be conferred. The dissertation must be submitted to the Graduate Office from seven to ten days before the scheduled date of the student's examination.

Publication on Microfilm. All doctoral dissertations will normally be published on microfilm through University Microfilms, Ann Arbor, Michigan. Authors may, if they wish, also copyright them. The abstract will be published in Dissertation Abstracts. Before final typing is completed, the candidate should obtain in the Graduate Office detailed instructions on the procedure together with a microfilming agreement which is signed and returned when the dissertation is finally deposited in the Graduate Office.

In brief, all copies of the dissertation, the original in clean type, will remain unbound except for spring binders. Ten copies of an abstract, carefully written and not more than 600 words long, are submitted when the dissertation is first presented to the Graduate Office. A non-returnable dissertation fee of \$25 is charged for handling and microfilming. If copyright is desired, an additional fee is charged of \$6 plus 2½ cents per page. The original copy and first carbon copy will be bound by the Ruzicka Bindery. The fee is \$5.00 a volume. The student may request that more than the two copies be so bound.

Final Examination

The final oral examination shall be primarily on the dissertation. Questions may, however, be asked in the candidate's major field. Except in unusual circumstances approved by the Dean a final examination will not be scheduled between the last day of the spring examination period and registration day in the fall semester.

If a student fails his final examination, he may be allowed to take it for a second time, but not sooner than six months from the date of his first. Permission to take the second examination must be obtained from the instructor who directed the dissertation and from the Dean of the Graduate School. Failure to pass the second examination renders the student ineligible to continue work for the Ph.D. degree at Duke University.

Cooperative Plan of Study with Selected Colleges and Universities

Since its inception the Duke School of Forestry has had the cooperation of Trinity College (the men's undergraduate college of arts and sciences of Duke University) in preparing students for professional careers in forestry. Under the plan, a student devotes his first three years to a eoordinated and earefully integrated program of study in the basic arts and sciences in Trinity College. The two following school years are spent in the School of Forestry. Upon the successful completion of this five-year course of study, a student will have earned the Baehelor of Seience degree from Trinity College and the professional Master of Forestry degree from the Duke School of Forestry.

Based upon the experience and success of this cooperative program with Trinity College, the School of Forestry in 1952 initiated similar programs of eollaboration with a selected group of eolleges and universities located throughout the United States. These programs offer students the numerous advantages of a broad background in liberal arts and sciences as preparation for later professional training. A student intent upon following such a course of study should make application to one of the colleges listed on pages 18-21. Admission requirements and other information pertinent to matriculation may be obtained from each of these institutions. Not later than the end of the first semester of the third year in the college or university of his choice, the student may make formal application for admission to the Duke School of Forestry. To qualify for admission under these programs, a student must have followed a course of study arranged in consultation with his advisor, must have the official recommendation of his college, and must meet the minimum requirements for admission to the Duke School of Forestry.

Institutions Cooperating with the School of Forestry in the Academic-Forestry Program

Alabama

Samford University Birmingham 35209

Colorado

Colorado College Colorado Springs 80903

Florida

Florida Southern College Lakeland 33802 Rollins College Winter Park 32791 Stetson University, College of Liberal Arts Deland 32720

Georgia

Mercer University Macon 31207

Illinois

Illinois Wesleyan University, College of Liberal Arts Bloomington 61710

Indiana

Butler University, College of Liberal Arts and Sciences Indianapolis 46207

Indiana Central College Indianapolis 46227

Iowa

Iowa Wesleyan College Mount Pleasant 52641

Kansas

Baker University Baldwin 66006

Louisiana

Centenary College of Louisiana Shreveport 71104

Maryland

Western Maryland College Westminster 21158

Michigan

Albion College Albion 49224

Mississippi

Millsaps College Jackson 39210

Missouri

William Jewell College Liberty 64068

Nebraska

Doane College Crete 68333

New Jersey

Drew University, College of Liberal Arts Madison 07940

New York

Hofstra College Hempstead, Long Island 11550

North Carolina

Catawba College Salisbury 28144 Duke University, Trinity College Durham 27706 Guilford College Guilford College 27410 High Point College High Point 27262
Wake Forest College Winston-Salem 27106

Ohio

Baldwin-Wallace College Berea 44017 Denison University, A College of Liberal Arts and Sciences Granville 43023

Heidelberg College Tiffin 44883

Kent State University, College of Liberal Arts Kent 44240

Marietta College Marietta 45750

Miami University, College of Arts and Sciences Oxford 45056 Ohio University Athens 45701

Otterbein College Westerville 43081 Wittenberg College Springfield 45501 Youngstown University Youngstown 44503

Oregon

Reed College Portland 97202 Willamette University, College of Liberal Arts Salem 97301

Pennsylvania

Albright College Reading 19604
Elizabethtown College Elizabethtown 17022
Franklin and Marshall College Lancaster 17603
Gettysburg College Gettysburg 17325
Juniata College Huntingdon 16653
Lebanon Valley College Annville 17003
Lycoming College Williamsport 17704
Moravian College Bethlehem 18018
Muhlenberg College Allentown 18104
Thiel College Greenville 16125

South Carolina

Furman University
Newberry College
Wofford College
Wofford Spartanburg 29301
Wofford Spartanburg 29301

Tennessee

Carson-Newman College Jefferson City 37760 Chattanooga, University of, College of Liberal Arts Chattanooga 37403

East Tennessee State University Johnson City 37602 Lincoln Memorial University Harrogate 37752 Tennessee Wesleyan College Athens 37303 Tusculum College Greenville 37743

Texas

Baylor University, College of Arts and Sciences Waco 76706 Southwestern University, College of Arts and Sciences Georgetown 78626

Virginia

Bridgewater College Bridgewater 22812 Randolph-Macon College Ashland 23005 Richmond, University of, Richmond College Richmond 23173 William and Mary, College of Williamsburg 23185

West Virginia

Davis and Elkins College Elkins 26241 Marshall College Huntington 25701 West Virginia Wesleyan College Buckhannon 26201

Wisconsin

Beloit College Beloit 53512

Resources for Study

General and Research Facilities

The School of Forestry is housed in the south wing of the Biological Sciences Building on the West Campus. The programs of the School provide for classroom, laboratory, and field instruction in the fundamental disciplines of forestry and wood science. Specialized training may be elected in forest management, forestry or forest products business management, forest economics, silviculture, silvics, forest entomology, forest biometry, forest pathology, forest biochemistry, mensuration, forest soils, tree physiology, forest hydrology, forest climatology, wood anatomy, timber physics, chemistry of wood, harvesting and processing, and several other areas in forest products technology.

General and research laboratories are provided for routine and original studies in all of the subject matter fields. These laboratories are equipped with instruments and facilities for quantitative evaluation of biological materials and processes. Greenhouses immediately adjacent to the Biological Sciences Building and the nearby Duke Forest offer excellent facilities for biological investigations in controlled and natural environments. An IBM system 360 Model 75 Digital Computer, housed in the

Physics Building, is available for processing research data.

Facilities of allied departments of the University are also available for advanced work in chemistry, economics, genetics, mathematics, plant anatomy, plant ecology, plant pathology, and plant physiology.

West Virginia Pulp and Paper Company has made available to Duke University a field headquarters for work in the forests of the South



Excellent greenhouse facilities are available for study of the biology of forest trees.

Atlantic Coastal Plain. This camp, located 18 miles northwest of Summerville, South Carolina, is used as a base for field instruction in timber harvesting, wood utilization, soils, silviculture, and forest management.

The School periodically sponsors conferences and symposia on industrial forest management and other technical and scientific subjects. These offer the current viewpoints of many outstanding individuals

in both forestry and in allied fields.

The University library, with 1,783,803 volumes and 3,868,810 manuscripts, provide exceptional resources and facilities for study and research by undergraduate and graduate students, and by visiting scholars. About 70,000 volumes are added annually, while 150 foreign and domestic newspapers and 8,700 periodicals are received currently. Large collections of microfilms of rare books, newspapers, and periodicals are also available.

The Biology-Forestry library (87,076 volumes), Chemistry library (22,605), Physics-Mathematics library (30,653) are housed for convenience of use in the buildings of these departments. The libraries of the Schools of Divinity (125,854), Law (144,716), Medicine (77,407), and of the College of Engineering (36,192) are also shelved in the buildings of these schools, all on the West Campus. The Womens College Library on East Campus includes another 155,427 volumes.

The Duke Forest

The Duke Forest, of approximately 7,500 acres, is particularly well

situated for field work. A five-minute walk from the eampus will take one well into many parts of the area, while even the most distant portions

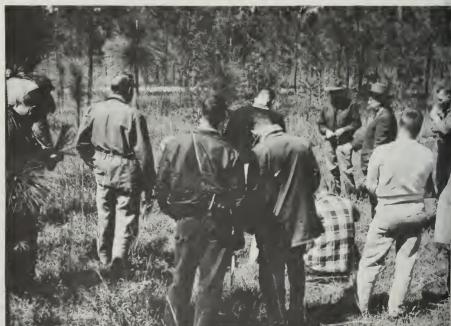
can be reached by automobile in about twenty minutes.

Short-term research projects are conducted on the Forest by graduate students in forestry, botany, zoology, and other disciplines. More extensive problems are investigated by the faculty with student assistance, segments of which may be used by students for observation, analysis, and interpretation. Many of these studies serve admirably as instructional material. The Forest provides additional instructional material, as well as demonstrations on an operational scale, of advanced forest practices developed at Duke and elsewhere.

The Forest lies in Durham and Orange Counties near the eastern edge of the Piedmont Plateau. A cross-section of much of the woodlands in the upper coastal plain and lower Piedmont of the Southeast is represented on the Forest with its variety of topography, soil, forest conditions, and patterns of past land use. Elevations range from 280 to 760 feet. The soils are derived from such diverse parent material as metamorphic rock of the Carolina slate formation, granite, Triasic sedimentary rock, and basic intrusives. Nearly one hundred tree species are represented. Some eighteen miles of improved woods roads make all parts of these woodlands readily accessible. It serves as an outdoor laboratory for instruction in forestry and allied fields, and as an experimental forest for research in problems of timber growing and in the sciences basic thereto. It is also used to demonstrate methods of silviculture and forest management applicable to the region.

At few other places in America are there provisions for extensive field study and research in forestry literally at the door of a large university.

Field trips throughout the Southeast permit personal exposure to current trends in intensive forestry.





The Duke Forest is well utilized by students to test theories concerning the tree and its environment. Here a student monitors the uptake of radioisotopes in a plantation.

This natural outdoor laboratory, so conveniently located and representative of the region, is a most valuable supplement to the instructional, laboratory, and library facilities of Duke University.

Forest Sciences Laboratory

The establishment of the Forest Sciences Laboratory research facility of the United States Forest Service's Southeastern Forest Experiment Station in the Research Triangle Park near Durham provides an unusual opportunity for complementing the research programs of students in the School of Forestry. Specialized research projects in forest entomology, pathology, physiology and soils are currently under way at the Laboratory. The research staff of the Laboratory is available for consultation, participation in seminars, and service on graduate committees of students in the School of Forestry. Arrangements may also be made for students to conduct certain aspects of their research at the Laboratory.

Student Life

Living Accommodations

Housing

The Graduate Center is available to students of the graduate and professional schools. It contains bedroom facilities for four hundred students, complete with lounges, study rooms, recreational rooms, post office, and dining hall. The rooms are equipped for two persons. Rooms are rented for the academic year, but for no period of less than one semester.

Room reservations are made through the Director of Housing only after official acceptance for admission to the University. A \$25.00 room deposit is required of each applicant before a room reservation is made. The initial room deposit is effective during the student's residence in the University if attendance is continuous in regular academic years. This deposit will be refunded under the following conditions:

1. Within thirty days after the student has been graduated.

2. Upon withdrawal from the University, provided written notice is received by the Director of Housing by August 1, for cancellation of a reservation for the fall semester; and not later than January 15, for cancellation of a reservation for the spring semester.

3. When the reasons requiring withdrawal are beyond the student's

control.

No refund is made until the occupant has checked out of his room through the Director of Housing and has settled all of his accounts with the Treasurer.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Director of Housing for confirmation of the reservation in accordance with the plan that is published during the school year.

Any exchange of rooms must be arranged with the Director. Persons exchanging rooms without approval will be subject to charges for both

rooms.

The authorities of the University do not assume responsibility for the persons selected as roommates. Each student is urged to select his roommate when the room is reserved.

Beds and mattresses (39" x 74"), tables, chairs, dressers, mirrors, and window shades are furnished by the University. The student supplies linens, blankets and pillows. Rugs, totaling not more than 54-square-feet, study lamps and curtains are permissible, and if desired, are furnished by the students.

Duke University Apartments are available to married graduate students. For further information on apartments for married students, write to the Director of Housing, Duke Station, Durham, North Carolina.

Duke University desires to provide for its students a residential environment conducive to academic achievement, the development of high ideals, and sound character. The institution asks and believes that each student will cooperate in achieving these aims by arranging his personal belongings in an orderly manner, by caring for the buildings and furniture as he would in his own home, and by observing a code based on gentlemanly behavior in an educational environment which demands respect for all residents. Regulations governing the occupancy of rooms will be supplied directly from the Housing Bureau when room reservations are made. Occupants are expected to abide by these regulations.

Women students will be housed in graduate women's facilities. For further information write, Director of Housing, Duke University, Dur-

ham, N. C.

Firearms (including air rifles) may be brought into the residence halls only upon written permission and registration with the Dean of Men of Duke University.

For the cost of housing at Duke, see the chapter on Financial Information.

Dining Service

The dining facilities on the West Campus include three cafeterias with multiple-choice menus, and the Oak Room where full meals and a la carte items are served. The cost for the academic year ranges from \$550.00 upward depending on the tastes of the individual.

In the Graduate Center there is a cafeteria with multiple-choice menus and a Coffee Lounge where sodas and sandwiches are served from 11:30 A.M. to 11:00 P.M. The prices in these dining rooms are the same as those on the West Campus.

Due to the large number of those served in the dining halls, it is not possible to arrange special diets for individual students. Special diets for

the sick are served in the infirmary.

Services Available

Medical Care

The complete medical facilities of the Duke University Medical Center are available to all members of the University community. To secure the benefits of the Student Health program, a graduate student during the term or semester in which the illness occurs must (1) in the Summer Session term be registered for at least 1 unit research or 3 units of course work, (2) prior to completing minimum residence requirements be registered for at least 9 units per semester. Students are not covered during vacations and their dependents and members of their family are not covered at any time. Care is provided for men at the Student Health Office in Duke Hospital and for women at the Woman's College Infirmary.

The service provided includes hospitalization in Duke Hospital, when recommended by the Hospital staff, to a limit of thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Students pay for board while in the hospital. Excluded from the service are refraction of eyes, treatment of teeth, and of all chronic and pre-existing conditions, and elective surgery.

Graduate students are urged to carry adequate health insurance to supplement Student Health Program services. If students have insurance providing hospitalization, surgical, or medical benefits, the benefit shall be applied to the cost of their medical care. Foreign students are required to hold this or another acceptable policy.

Student Activities

Forestry students new to Duke University are reminded that they are welcome to use such recreational facilities as swimming pools, tennis courts, golf course, and to affiliate with choral, instrumental, drama, and religious groups.

Students are encouraged to maintain broad professional contacts by

participation in the activities of the Society of American Foresters, the Forest Products Research Society, the national honorary scientific society of Sigma Xi, and other societies appropriate to their major field of study.

The social and business events of the Forestry Club provide opportunities for many pleasant extracurricular activities. An active organization of the wives of forestry students, the Forestry Dames, offers a regular schedule for social occasions of interest to this group.

The Duke University Counseling Center

Through the counseling center, the University provides a professional counseling service designed to aid students in gaining a better understanding of themselves and the opportunities available to them. Counseling is available in the areas of career planning, educational opportunities, and personal and social adjustment.

The Center maintains files of educational and vocational information related to career planning, graduate educational programs and fellow-

ships, and study aids.

National and University-wide testing programs are administered by the Center. A continuing program of research in the areas of counseling and testing is also carried on by the staff of the Center.

Appointments Office

Duke University maintains an active Appointments Office which has steadily been placing students in teaching, governmental and industrial positions. The services of this office are available without charge to graduate students. Those who are interested in securing employment through the Appointments Office, or those who wish to have available for their own use a complete file containing their academic record and pertinent recommendations, should register in this office.

Visiting Scholars

The libraries and, to the extent practicable, other facilities of Duke University will be made available to faculty members of colleges and universities who wish to spend a period of time on the campus in pursuit of their scholarly interests. No fees will be charged such visitors unless they wish to participate in activities for which a special fee is assessed. Room and board may be arranged for at the regular rates in the dormitories and dining rooms. Dormitory space is usually available during the summer months. Inquiries concerning residence for visiting scholars should be directed to the Dean of the Graduate School of Arts and Sciences.

Admission

Master of Forestry

The admission requirements of the School of Forestry for work toward the Master of Forestry degree presuppose that an applicant is either:

1. A graduate of a professional school of forestry, or

2. A graduate of a college or university of high standing, but without

prior professional training in forestry, or

3. A student who has successfully completed three years of approved study at one of the colleges (listed on pages 18-21) cooperating with the School in the academic-forestry training program.

Each applicant must present a certified transcript of his academic record showing the courses he or she has taken, the number of credit hours he or she has earned, and the grades received. Although specific courses are not required for admission, applicants must be aware that many fields within forestry require academic preparation of a specialized nature. Deficiencies, if any, may be satisfied in residence, possibly prolonging the time necessary to complete degree requirements. Students interested in specialized areas of forestry should write the Dean for advice as to specific preparatory courses.

An applicant who is a graduate of a professional school of forestry will present a certified transcript of his or her scholastic record showing the

attainment of a degree. Before registering for the first semester of residence, the students will be required to select the branch or branches of forestry in which they wish to concentrate the major part of their work and to prepare their proposed programs in conference with an appropriate faculty advisory committee. Ordinarily, graduates of a fully accredited school of forestry should be able to meet all requirements for the Master of Forestry degree in one full school year of resident study; others may require a longer period of residence.

Doctor of Forestry

Admission to the School of Forestry for a program of study and research leading to the degree, Doctor of Forestry, is granted to a student who has

received the degree, Master of Forestry, or its equivalent.

An applicant must file a formal application for admission together with transcripts of his undergraduate and graduate academic records. In his application he should clearly state the branch of forestry in which he desires to concentrate, and if possible, the specific research.

The Director of Admissions of the School of Forestry, together with the prospective student's major advisor, will determine if the qualifications of

the applicant meet entrance requirements.

Master of Science and Doctor of Philosophy

Applications for admission into M.S. and Ph.D. programs in forestry should be submitted to the Director of Admissions, Duke School of Forestry, for transmittal to the office of the Dean of the Graduate School.

A student seeking admission to the Graduate School of Arts and Sciences of Duke University must have received an A.B. or B.S. degree (or the equivalent in the case of foreign students) from an accredited institution. His undergraduate program should be well rounded and of such quality as to give positive evidence of capacity for graduate study.

Financial Information

The following table shows the general fees and charges collected from all students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration and no student is admitted to classes until arrangements have been made with the Bursar of the University for the settlement of fees. After the day of registration no refund of tuition or the general fee will be made except for involuntary withdrawal to enter the armed services.

Tuition and Fees

Tuition, per semester\$625.0	00
General Fee, per semester\$ 72.5	
Spring field seminars\$ 10.0	
Absentia Fee, per semester (when applicable)\$ 40.0	00

Forestry students may obtain admission to all regularly scheduled University athletic contests held on the University grounds during the entire academic year by payment of an athletic fee of \$15.00 per year plus any Federal taxes that may be imposed. This fee is payable in the fall semester.

Transcripts

A student is entitled to one free transcript of his academic record. A charge of one dollar is made for each additional copy.

Living Accommodations

Rooms in the Graduate Center are equipped for two persons. The rental charge for a double room is \$620.00 for the academic year, or \$310.00 for each occupant, or \$155.00 per occupant for each semester. Rooms are rented for the academic year, but for no period of less than one semester.

Duke University Apartments are available to married graduate students. The rental rates per month are set at \$70.00 for an efficiency apartment, \$90.00 for a one-bedroom apartment, and \$110.00 for a two bedroom apartment.

Housing for women students in the graduate women's facilities is

available at comparable rates.

No refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedules.

Motor Vehicles

Each student possessing or maintaining a motor vehicle at Duke University shall register it annually at the beginning of the fall semester. If a student acquires a motor vehicle and maintains it at Duke University after enrollment, he must immediately register it. At the time of registration of a motor vehicle the following documents must be presented:

- (a) State vehicle registration certificate.
- (b) Valid driver's license.
- (c) Satisfactory evidence of automobile liability insurance coverage with limits of at least \$5,000 per person and \$10,000 per accident for personal injuries, and \$5,000 for property damage, as required by the North Carolina Motor Vehicle Law.
- (d) If the student is under 21, a statement signed by the student's parent or guardian granting the student permission to operate a motor vehicle at Duke University.

There is a registration fee of thirty dollars per year for each automobile operated on the campus by residents of the Graduate Center. There is a similar fee of fifteen dollars for the registration of two-wheeled motor vehicles.

Estimated Expenses for an Academic Year

The necessary expenses of a graduate student are moderate. The University dormitories provide thoroughly comfortable and wholesome living conditions at a minimum cost, while all charges made by the University have been kept low. Incidental expenses naturally depend upon the tastes and habits of the individual. The following table summarizes expenses in the School of Forestry for one year:

	Low	Moderate	Liberal
Tuition	\$1250.00	\$1250.00	\$1250.00
General Fees	145.00	145.00	145.00
Room-rent	\$ 310.00	\$ 310.00	\$ 380.00
Board	\$ 500.00	\$ 550.00	\$ 600.00
Laundry	25.00	35.00	45.00
Books	50.00	60.00	70.00
Athletic Fee (optional)	15.00	15.00	15.00
Spring field seminars	10.00	10.00	10.00
	\$2305.00	\$2375.00	\$2515.00

Student Aid

Fellowships, Scholarships, and Assistantships

A number of fellowships, scholarships, and assistantships are allocated to the School of Forestry for the encouragement and financial assistance of men and women who offer promise of becoming leaders in the forestry profession. These are awarded to applicants of high character on the basis of scholastic ability as judged by previous educational performance, professional experience, personal references and the Graduate Record Examination.

Holders of the awards will pay tuition and such additional fees as are regularly required.

The awards are of three classes:

Fellowships

From five to eight fellowships, with stipends ranging from \$2,000-\$3,600 per academic year. Each recipient must have previously completed work equivalent to that required at Duke University for a Master's degree with a major in forestry or in a discipline basic to forestry. He will devote his time to an approved program of study and research in any of the branches of forestry. He is expected to become a candidate for the degree of Doctor of Forestry or Doctor of Philosophy.

Scholarships

From fifteen to eighteen scholarships with stipends ranging from \$1400-\$2500 per academic year. Each recipient will normally devote his time

to an approved program of study leading to the degree of Master of Forestry, or Master of Science with a major in forestry.

Graduate Assistantships

One to several graduate assistantships with variable stipends up to \$4000, depending upon available funds and upon whether granted for the academic year only, or the academic year plus the summer. Each recipient will devote half-time to research or other work of the School of Forestry. He will be permitted to enroll for not more than 20 semester hours in an academic year in an approved program of study, or study and research, leading to a degree of Master of Forestry, Master of Science, Doctor of Forestry, or Doctor of Philosophy.

Two industry-sponsored stipends are also awarded annually to qualified scholars. These are: The Koppers Company, Inc. Scholarship of \$1600.00; and The Brunswick Pulp and Paper Company Fellowship for Research in

Hardwood Silviculture of \$2000.00.

Application for Awards

Any student admitted to the School of Forestry is eligible to apply for a fellowship, a scholarship or an assistantship. Application for these awards may be made concurrently with the application for admission.

The general procedures and requirements for applying for any financial award in the School of Forestry are outlined below. Applicants should initiate the necessary action early to insure that the required documents are filed with the Dean of the School of Forestry on or before March 1 prior to enrollment.

1. File award application. Form will be supplied by the School of Forestry on request.

2. Furnish supporting documents as follows:

a. Official transcripts of record of all previous college or university credits earned.

b. Letters of reference from at least three persons familiar with the applicant's character, scholarship, and professional ability.

(Documents offered in support of admission, if so designated, may also serve in support of the application for financial award.)

3. Complete the Aptitude Test of the Graduate Record Examination. Instructions and application for admission to this locally administered examination are available on most college campuses, from the Duke School of Forestry, or by writing the Educational Testing Service, Princeton, New Jersey. Applicants should plan to take this examination in January or earlier.

Notification of awards is made on April 1. In case vacancies occur, completed applications received after March 1 will be considered at a later date.

In every instance where a graduate assistantship, scholarship, or fellowship for the next academic year is offered to an actual or prospective graduate student and accepted before April 15, the accepter may resign his appointment without prejudice prior to that date by notification in writing to the Dean. However, an acceptance given or left in force after April 15 obligates him not to accept another appointment without first obtaining formal release from the Dean of the School.

Loans

Students who are enrolled as full-time degree candidates and who have satisfactory academic and citizenship records are eligible to apply for student loans.

Loans from university funds generally mature after borrowers have left the University. Interest accrues on long-term loans from University funds at the rate of one percent per annum from the date of each note. After a student has left the University permanently, the loans begin accruing interest at the rate of three percent per annum for a period of five years. Interest accrues at the rate of six percent after the three percent ceases to be effective.

In addition to local loan funds, Duke University participates in the student loan program established under the provisions of the National Defense Education Act of 1958. Repayment of these loan funds normally begins one year after the student terminates full-time study. Interest accrues at the rate of three percent per annum commencing one year after termination of full-time study. Upon completion of the period of grace of 12 consecutive months, the ten-year annual repayment period begins, and simple interest on the loan at the rate of three percent starts to accrue. At this point the borrower still has one additional year before his first annual payment becomes due. The first annual installment will therefore fall due 24 months after the borrower has ceased being a full-time student in an institution of higher learning.

Special benefits to those teaching in non-profit schools, colleges, and universities permit a portion of the loan to be cancelled depending upon the length of teaching service.

Complete details regarding the student loan program may be obtained by writing to the Student Loan Division of Duke University. In approving loan applications, the Student Loan Committee selects those students who, from the standpoint of character, scholastic attainment, personality and degree of financial need, are deserving of this consideration. All applications for loans should be made before July 1 preceding the academic year in which the student plans to matriculate.

All applications for loans should be made to the Student Loan Division,

Allen Building, Duke University, Durham, N. C. 27706.

University Registration and Regulations

Registration

All students who enter course work or residence for credit; all students who have completed minimum requirements for an advanced degree, but continue to use the facilities of the University in their research; all students in *in absentia* status; and all students who wish merely to audit a course or courses must register.

After the applicant has received notification of his admission to the School of Forestry and has returned his statement of acceptance of admission, he may present himself for registration. During the registration periods, announced in the *Bulletin*, he first confers with an assigned faculty advisor who prepares and signs a course card, listing the course work to be taken during the semester. The student then presents this course card to registration officials, who enroll him officially in his courses. After his first registration period as a current student he will preregister at the stated times for pre-registration. Failure to pre-register incurs the penalty for late registration. Former students who intend to register to resume a degree program must give the Director of Admissions notice of this intention two months before registration.

Late Registration

All students are expected to register or pre-register at the times stated in the Bulletin. Those registering late, including those who are obliged to register in absentia, are subject to a late registration fee of \$5.00.

Change of Registration

During the academic year within a period of fourteen days from the registration date students may change registration with the approval of his advisor, if no reduction of fee is involved, and with the approval of the Dean if reduction of fee is involved. Thereafter during the first thirty days from the registration date the only permissible change is dropping course-seminar registration and adding equivalent units of research, with the approval of his advisor, the instructor of the course, and the Dean.

Normal Registration

A graduate student is designated as fully registered when he registers for the maximum credit his program requires. Required registration is set in consideration of the student's obligation to teach or assist and the stage he has reached in completion of degree requirements. In the academic year normal registration for the resident student who does not hold an appointment as part-time instructor or assistant or does not engage in part-time work is 15 units a semester or 30 units an academic year. The normal registration for the student who holds such an appointment or undertakes such work is either 12 units or a minimum of 9 depending upon the number of hours a week he is required to devote to such duties.

The resident student in a terminal master's program which requires no thesis carries normal registration until he has met all degree requirements. If a thesis is required and the student has met all requirements except for submitting his thesis, he registers for 3 units a semester while in residence or, if he elects to go out of residence, for 1 unit in absentia each semester

until the thesis is accepted.

The resident student engaged in a master's program which is not terminal but preparatory to a doctoral program registers as though he

were a doctoral student.

The resident student in a doctoral program carries normal registration through the semester in which he passes the preliminary examination. If he remains in residence, he continues to register for a minimum of 3 units a semester until the dissertation is accepted. If, before or after passing the preliminary examination, he elects to go out of residence, he registers for 1 unit a semester in absentia in order to keep his program active.

It is necessary to be a fully registered student according to the regulations listed above (except when registered in absentia) in order to establish eligibility for library carrel and laboratory space, for student housing, for University and some outside loans, for Student Health service including the voluntary Walker plan coverage, and for reporting status

for military duty.

The registration of 1 unit a semester in absentia provides occasional consultation with the thesis or dissertation supervisor. It may be waived

for military duty or serious problems of health.

In the Summer Session 6 units a term is maximum registration. Students resident in the academic year who wish to continue study and use of University facilities including Summer Session Student Health during the summer must register for 1 unit in the first Summer Session term. This registration provides use of these facilities for both terms.

Transfer of Graduate Credits

Credit for graduate course work earned at another institution will be determined only after a student has spent one semester at Duke University. After completing his first semester, the student through his Director of Graduate Studies should file a request that his credits be reviewed and a decision be made.

Reciprocal Agreement with the Consolidated University of North Carolina

Under a plan of co-operation between the University of North Carolina and Duke University, students regularly enrolled in the Graduate Schools of the University of North Carolina during the regular academic year, and paying full fees to that institution, may be admitted to a maximum of two courses per semester in the Graduate School of Duke University upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. Under the same arrangements, students in Forestry and the Graduate Schools of Duke University may be admitted to course work at the University of North Carolina. A similar arrangement is effective in the Summer Sessions. (See the Summer Session Bulletin.)

Grades

Grades in the School of Forestry are as follows: E (exceptional); G

(good); S (satisfactory); F (failing); and I (incomplete).

An I (incomplete) indicates that some portion of the student's work is lacking, for an acceptable reason, at the time grades are reported. The instructor who gives an I for a course specifies the date at which the student must have made up the deficiency, in no case more than one calendar year from the date the course ended. If the course is not completed, the grade of F is entered upon the student's record unless his appeal to the Dean for the grade No Credit is approved.

A grade of F in any course normally occasions withdrawal from a

degree program.

Courses of Instruction

School of Forestry Courses

Courses for Seniors and Graduates

201. Forest-Tree Physiology. The principal physiological processes of trees, including water relations, synthesis and use of foods, and growth phenomena. Prerequisites: Botany 1-2 or equivalent; one year of chemistry. 3 s.h. (fall). Professor Kramer

203. Forest Meteorology. The science of meteorology, including microclimatology, as it is related to forest biology and hydrology; emphasis is on physical laws governing exchange of heat and moisture in the climatic environment. 3 s.h. (fall). Associate Professor Knoerr

212. Harvesting and Utilization of Forests. Principles, procedures, and cost determinations in harvesting timber products with emphasis on managed forests in North America. Processing of wood as a raw material by important forest industries. 3 s.h. (spring). Professor Wackerman

216. Lumber Manufacture. Methods of processing logs for sawn products with emphasis on the principles involved in obtaining maximum volume and quality yield for large and small mills; trends in lumber consumption by regions; use of waste for by-products; the development of new lumber products; and industry problems. Prerequisite: Forestry 212 or equivalent. 3 s.h. (spring). Professor Wackerman

218. Harvesting and Forest Products Field Seminar. Field studies of the major regional forest products industries; observation and application of harvesting techniques. 1 s.h. (spring). Assistant Professor White

223. Forest Pathology. Principles of plant pathology with emphasis on the biology and control of representative forest tree diseases of North America; introduction to products pathology; correlated field and laboratory studies on the diagnosis of tree diseases and wood decay. Prerequisite: Forestry 201 or consent of instructor. 3 s.h. (spring). sociate Professor Stambaugh

230. Forest Entomology. Principles of protecting forests from injurious insect infestations; characteristics and identification of insect-caused damage to trees and wood products; identification, biology, and control of the more important tree-infesting insect species. 3 s.h. (fall).

Anderson

232. Forest Products Entomology. Study of the characteristics and identification of various types of injury to wood products caused by insects and other wood-damaging animals; identification, biology, and control of wood-damaging animals. Prerequisite: Forestry 230 or equiv-

alent. 2 s.h. (spring.) Professor Anderson

243. Forest Ecology. Ecological foundations of silviculture with special reference to forest site factors; influence of forests on their environment; growth and development of trees and stands; origin, development, and classification of forest communities; methods of studying forest environments. Desirable prerequisites: plant physiology, plant ecology, and Forestry 261, or equivalents. 3 s.h. (fall). Associate Professor Woods

244. Theory and Practice of Silviculture. Principles governing establishment, treatment, and control of forest stands; natural and artificial methods of reproduction, intermediate cuttings, and cultural operations with emphasis on the principal forest types of temperate North America. Field practice in silvicultural operations and study of managed stands. Prerequisite: Forestry 243 or equivalent. 3 s.h. (spring). Professor White

247. Biological Nucleonics. Fundamentals of nucleonics; instruction in biological uses of radioactive tracers; counting instruments and measurements; legal requirements. Prerequisites: consent of instructors; one year each of college biology, chemistry, and physics. 3 s.h. (spring).

sociate Professor Woods and Professor Fluke

248. Forest Regeneration. Fundamentals and practices of regenerating forest stands. Genetic control through recently developed propagating techniques; seed handling in the field, and during preparation for use; techniques for large production tree nurseries; the use of heavy equipment, chemicals, and fire for site preparation and timber stand improvement; recent developments in direct seeding and planting. 3 s.h. (fall). Associate Professor Woods

249. Identification of American Trees and Their Timbers. Studies

leading to the recognition of the important timbers of the United States and of the trees that produce them. 4 s.h. (spring). Professor Harrar and Assistant Professor White

250. Forest Biometry. Statistical methods essential to the collection, analysis, and interpretation of forest data; includes regression and correlation techniques, Chi-square tests of associations, and tests of significance; short-cut computational procedures. Special attention is devoted to the use of statistical techniques in forest administration and mensuration problems. 3 s.h. (spring). Professor Osborne

251. Sampling Methods in Forestry. Statistical background for solution of sampling problems with special references to sampling of forest and as-

sociated populations. 3 s.h. (fall). Professor Osborne

253. Computer Science in Forestry. Components and organization of a computer system; automatic programming languages; storage and retrieval systems (TSAR); equation fitting by iteration and lest squares methods; graphical techniques. 1 s.h. Assistant Professor Braaten

256. Forest Measurements. Application of plane surveying technique to the measurement of land area, topography and timber type; measurement of volume and growth of forest trees and stands; measurement of

forest products. 4 s.h. (fall). Assistant Professor White

257. Design of Forestry Experiments and Analysis of Data. Role of experimental design in field and laboratory, and statistical analysis of data as aspects of the scientific method in forestry research. 3 s.h. (fall). Assistant Professor Braaten

258. Operations Research, Mathematical model formulation and development of techniques to aid decision making in problems of natural resource allocation and use. Includes the theory and techniques of inventory control, equipment replacement planning, queing theory, competitive strategies, allocation, sequencing and dynamic programming. Consideration is given to both deterministic and nondeterministic models. Assistant Professor Braaten 3 s.h. (spring)

261. Forest Soils. Origin, development, and classification of soils with special emphasis on those developed in humid climates; morphological, physical, and chemical properties of soils in relation to growth of trees;

effect of forests on soils. 3 s.h. (fall). Professor Ralston

269. Resource Economics and Policy. Development and critical review of concepts useful in understanding and evaluating the distribution of natural resource use over time in terms of the relations between technological knowledge, group and individual behavior, and social institutions. 3 s.h. (fall). Professor Yoho

270. Economics of Forestry. Development of the principles of economics useful in the analysis of the past, present, and prospective supply and demand situations for forestry goods and services; problems of the economics of the firm and industry basic and peculiar to forestry, with special attention to the time dimension of value; the role of forestry in the general economy including attention to relevant institutional factors. 3 s.h.

(fall). Professor Yoho

272. Marketing Forest Products. Methods of selling and distributing lumber, timber, and other important forest products in domestic and foreign trade; trade-association functions; regional competition for markets; and transportation problems. Prerequisites: Forestry 212 and 270 or equivalents. 2 s.h. (spring). Professor Wackerman

276. Forest Policy. Objective study and analysis of the development of public land and forestry policies in the United States, present policies of public and private forestry organizations, and current policy issues in the light of economic and other criteria. Prerequisite: Forestry 270. 2 s.h.

(spring). Professor Yoho

281. Forest Management. Principles of organizing forest properties for systematic management, use of data obtained in surveys and inventories; principles of forest regulation, including a study of normal and actual forests, rotations, cutting cycles, and methods of regulating the cut in even-aged and all-aged forests for sustained yield; introduction to the preparation of preliminary forest management plans. 3 s.h. (fall). Professor Chaiken

283. Fire Behavior and Use. Impact of destructive agencies upon forests; principles of combustion, fire behavior, danger measurement and suppression; use of fire in forest management. 2 s.h. (spring). Pro-

fessor Chaiken

285. Forest-Game Management. Principles of management for the sustained production of desirable game and fur animals on forest land; characteristics and biology of important species. 2 s.h. (spring). Professor Anderson

286. Forest-Range Management. Principles of livestock management by which sustained maximum use can be obtained from forest grazing

lands. 2 s.h. (spring). Professor Anderson

289. Interpretation of Aerial Photographs. Principles of aerial photography and remote sensing as applied to forest administration, vegetation mapping, forest mensuration, and insect and disease surveys. Corequisite: Forestry 281 or equivalent. 3 s.h. (fall). Professor Chaiken

290. Wood Anatomy. Study of the minute structural characteristics of wood leading to the identification of the important woods of the United States, and the important tropical woods used in American woodworking industries. Prerequisite: Forestry 249 or equivalent. 3 s.h. (spring). Professor Harrar

291. Wood-Moisture Relations. Physical principles underlying the response of wood to moisture and its removal; the concept of equilibrium moisture content. Principles and methods involved in drying lumber and other wood products as a step in preparing them for use. Prerequisites:

Forestry 212, and 249 or equivalents. 2 s.h. (fall). Professor Wacker-

292. Microtechnique of Woody Tissue. Preparation of wood for microscopic study including sectioning, staining, and mounting techniques; elementary photomicrography. Prerequisites: Forestry 249 and 290 or equivalents. 3 s.h. (fall). Professor Harrar

293. Wood Preservation. Principles, methods, and materials used in treating wood to increase its durability, service-life, and fire resistance. Prerequisites: Forestry 212 and 249, or equivalents. 2 s.h. (fall).

fessor Wackerman

295. Surface Generation in Wood. Directed energy systems; physics of edges; details of wood surface generating machinery; surface generation in relation to wood anatomy; physical measurement of wood surfaces. Prerequisites: For. 290 or equivalent, calculus. 2 s.h. (fall). Professor Sullivan

296. Chemistry of Wood. Nuclear, atomic and molecular force systems; chemical composition and distribution of chemical components in wood; interaction of wood and moisture; macro-chemical reactions of wood and other cellulosic systems including degradation reactions. Prerequisites: Forestry 290 or equivalent, calculus, organic chemistry. 3 s.h. (fall).

Associate Professor Sullivan

297. Wood Physics (Mechanics). A study of the reaction of wood to mechanical forces; the derivation of working properties and their variance; experimental and standard testing procedures; introduction to theories of elasticity and plasticity; theories of failure; anatomical and moisture effects. Prerequisites: Forestry 290 or equivalent, calculus, college physics, statistics. 3 s.h. (fall). Associate Professor Sullivan

201A. to 297A. Special Studies in Forestry. Work on the same level as the foregoing Senior-Graduate courses to meet the needs of individual

students. Credit and hours to be arranged. The Staff

For Graduates

301. (fall), 302 (spring). Advanced Studies in Forestry. Credits to be arranged. To meet individual needs of graduate students in the following branches of forestry:

1. Forest Ecology. Prerequisites: Forestry 141, 243, and 244 or equivalents. Associate Professor Woods

2. Forest Soils. Prerequisite: Forestry 261 or equivalent. sor Ralston

3. Silviculture. Prerequisites: Forestry 243 and 244, or equivalents. Assistant Professor White

4. Forest Management. Prerequisite: Forestry 281 or equivalent. Professor Chaiken

5. Forest Economics. Prerequisite: Forestry 270 or equivalent. Professor Yoho

6. Properties of Wood. Prerequisites: Forestry 141, and 290 or equivalents. Professor Harrar and Associate Professor Sullivan

- 7. Forest Mensuration and Biometry. Prerequisites: Forestry 250, and 352 or equivalents. Professor Osborne and Assistant Professor Braaten
- 8. Forest Entomology. Prerequisite: Forestry 230 or equivalent. Professor Anderson
- 9. Forest Utilization. Prerequisite: Forestry 212 or equivalent. Professor Wackerman
- 10. Dendrology. Prerequisite: Forestry 141 or equivalent. Professor Harrar and Assistant Professor White
- 11. Forest-Tree Physiology. Prerequisite: Plant physiology, plant ecology, and silvies. Professor Kramer
- 12. Forest Pathology. Prerequisites: Plant physiology and Forestry 223 or equivalents. Associate Professor Stambaugh
- 13. Forest Climatology and Hydrology. Prerequisites: Forestry 341, 342, or equivalents. Associate Professor Knoerr
- 14. Forest Biochemistry. Prerequisites: Plant physiology, organic chemistry. Professor Barnes
- 305. Forest-Tree Metabolism. Biochemical aspects of tree physiology and forest biology, with emphasis on primary assimilation processes, synthesis of major components and products of trees, and growth correlations. Prerequisites: Forestry 201 or equivalent; organic chemistry. 3 s.h. (spring). Professor Barnes
- 312. Cost and Quality Controls in Forest Utilization. Principles and methods of obtaining greatest efficiency of operations and maximum product value in harvesting and processing forest products; factors governing the relation of tree size to net stumpage values; and the application of these principles and methods in the solution of actual case problems. Prerequisites: Forestry 212 and 270 or equivalents. 3 s.h. (spring). Professor Wackerman
- 321. Phytopathological Technique in Forestry. Fundamentals of phytopathology and their application to field and laboratory investigations of tree diseases and wood degradation; biological interpretation of hostpathogen-environment interaction is stressed in literature review, experimentation, and scientific writing. Prerequisite: Forestry 223 or equivalent. 4 s.h. (fall). Associate Professor Stambaugh
- 322. Microbiology of Forest Soils. Qualitative and quantitative characterization of the microbial populations of forest soils with emphasis on rhizosphere interactions in root pathogenesis and mycorrhizal development; epidemiology of root diseases of trees; principles of control.

Prerequisites: Forestry 223, and mycology or bacteriology is recom-

mended. 3 s.h. (spring). Associate Professor Stambaugh

331. Toxicology of Insecticides. Study of the physical, chemical and biological properties of materials used to destroy insects. Formulation, toxicology and insect physiology as related to insecticide action are emphasized. Prerequisite: one course in entomology; organic chemistry is recommended. 3 s.h. (spring). Professor Anderson

332. Ecology of Forest Insects. Study of the environmental factors as they influence insect population development. Both the physical and the biotic aspects are considered on the basis of field and laboratory experimental methods. Prerequisite: Forestry 230 or equivalent. 3 s.h. (fall).

Professor Anderson

333. Morphology and Taxonomy of Forest Insects. Principles of insect structure, classification and nomenclature; laboratory work concentrated on the collection, preservation and identification of both the adult and immature stages of various forest insects. Prerequisite: Forestry 230 or equivalent. 3 s.h. (fall). Professor Anderson

342. Forest Hydrology. The influence of forests and other vegetation on local climate, the hydrologic cycle, and soil stability; relationships to water yield, floods, and erosion. Prerequisite: One year of college physics; calculus desirable. 3 s.h. (spring). Associate Professor Knoerr

344. Micrometeorology. Physics of the earth's surface environment with emphasis on plant and animal microclimate; budgets of mass, momentum and energy; vertical structure of wind, temperature, and water vapor in relation to exchange processes within the biosphere; local circulation and eddy diffusion. Principles in micrometeorological measurement. Prerequisites: Forestry 341; calculus desirable. 3 s.h. (spring). Professor Knoerr

347, 348. Forest Ecology Seminar. Advanced topics in silvics are discussed and current research papers and reports are reviewed, analyzed, and evaluated. Prerequisite: Forestry 243 or equivalent. 2 s.h. (fall and

Associate Professor Woods

352. Analysis of Forest Measurements. Empirical equations and curve fitting appropriate to forestry data; functional relationships among experimental responses; useful mathematical models for forestry populations; selected non-parametric analysis methods. Prerequisites: Forestry 250 or Mathematics 233 or equivalents. 3 s.h. (spring). Assistant Professor Braaten

353. Sampling and Experimental Design in Forestry. Theory and application of selected sampling designs to forestry populations. Includes multi-stage and multi-phase designs; acceptance and sequential sampling; regression, ratio, and double sampling; sampling with variable probability of selection. Construction and analysis of designs for forestry experiments. Prerequisites: Forestry 250 or Mathematics 230 or equivalents. 3 s.h. (fall). (Not offered 1966-67). Professor Osborne

357, 358. Research in Forestry. Credits to be arranged. Students who have had adequate training may do research under direction of members of the Faculty in the branches of forestry indicated under courses 301, 302 with the same prerequisites as thereunder noted; each branch to bear the same letter designation as under courses 301 and 302. (fall and spring). Staff

362. Forest Soil Physics. Analysis of the physical properties of soil related to the growth and development of forest trees. Consideration is given to the significance of soil moisture, temperature, aeration, and structural characteristics in the analysis of forest growth relationships. Prerequisite: Forestry 261. 3 s.h. (spring). Offered in alternate years with Forestry 366. (Not offered in 1966-67). Professor Ralston

364. Soil Classification and Mapping. Classification of soils as natural bodies. Mapping of soils, land use classes and forest site classes; field study will be made of soils in either the coastal plain or mountains. Pre-

requisite: Forestry 261. 3 s.h. (spring). Professor Ralston

366. Forest Soil Fertility. The relationships of soil fertility factors in the growth of forest trees. Emphasis placed on the analysis of soil factors related to the mineral nutrition of trees. Prerequisite: Forestry 261; analytical chemistry is recommended. 3 s.h. (spring). Professor Ralston

368. Field Seminars. Field studies, consultations, and visits to areas of interest during spring vacation period, or at other times, in the several branches of forestry listed under Forestry 301-302. Credits to be ar-

ranged. The Staff

378. Seminar in Forest Economics. Examination and discussion of the application of economic concepts in forestry, the potential contribution of economic analysis to private and public forest management; current research in forest economics. Prerequisites: Forestry 270 and 379 or consent of the instructor; advanced courses in economics and economic theory are

desirable. 2 s.h. (spring). Professor Yoho

379. Economic Analysis in Forestry. A critical exploration of static and dynamic economic theory including procedures in activity analysis applicable to forestry problems of resource allocation and production combinations, production location and timing; cost structure and asset control; uncertainty and expectations. Special attention to problems in formulating economic projections and forecasts relevant to forestry. Prerequisite: Forestry 270 or consent of instructor. 3 s.h. (fall). Professor Yoho

382. Legal Aspects of Forestry. A seminar discussion of certain state and federal laws pertinent to the management of forests: land ownership, trespass, public liability, timber contracts, labor relations, use of pesticides. 1 s.h. (spring). *Professor Chaiken*

385. Seminar in Forest Protection. Discussion of current problems in entomology, pathology, and fire behavior and evaluation of topical research for protection and control application in forest resource manage-

ment. Prerequisites: Forestry 223, 230, and 283. 1 s.h. (fall).

sors Anderson and Chaiken and Associate Professor Stambaugh

386. Seminar in Forest Management. Examination and analysis of techniques employed in the management of industrial and public forests, particularly in the South; discussion of problems of large scale intensive forest management. Prerequisites: Forestry 244, 281, and 379 or equivalent. 1 s.h. (spring). Professor Chaiken

390. Wood-Liquid Surface Interactions. Free surface energy of liquids and solids; theory of adhesion; adhesion for wood substrates; physical and chemical description of adhesives and adhesive joints; wood coatings; physical and chemical properties of surface coating materials. Prerequisite: Forestry 296. 3 s.h. (spring). Associate Professor Sullivan

392. Advanced Wood Physics. Theories of elasticity and plasticity; mechanical damping; piezoelectric properties; structure of crystals; fatigue failure. Prerequisites: Forestry 297, Forestry 296, Experimental

Design. 3 s.h. (spring). Associate Professor Sullivan

398. Tropical Woods. A study of the properties of various groups of tropical woods with particular emphasis upon those used in marine construction, and for lumber, plywood decorative paneling and furniture. Prerequisite: Forestry 290 or equivalent. 2 s.h. (spring). Professor Harrar

399. Seminar in Wood Science and Forest Products. Application of scientific disciplines to product research and development; wood science in industry. 1 s.h. (spring). Professor Harrar and Associate Professor Sullivan

Other Related Courses

A student in the School of Forestry, may, with the approval of the faculty of the School of Forestry and the Director of Graduate studies of the department concerned, include any of the following courses offered in the Graduate School of Arts and Sciences for which he has had adequate preparation. The student is referred to the Bulletin of the Graduate School of Arts and Sciences for the complete descriptive content of each course.

Biochemistry and Nutrition

Irwin Fridovich, Director of Graduate Studies

	S	.н.
201.	Introductory Biochemistry	4
203.	Chemistry of Natural Products	2
206.	Laboratory Methods in Biochemistry	. 2
301.	Energy Metabolism	3

302. Nitrogen Metabolism	
Botany	
W. Dwight Billings, Director of Graduate Studies	
	н.
202. Genetics	
203. Plant Cytology	
205. Anatomy	
221. Mycology	4
252. Plant Metabolism	3
252. Frank Metabolish 254. Plant-Water Relations	4
255. Plant Systematics	
256. Community Analysis and Classification	3
257. Principles of Plant Distribution	3
258. Physiology of Growth and Development	4
259. The Environment	3
305. Vegetation of North America	3
Chemistry	
L. D. Quin, Director of Graduate Studies	
	.н.
206. Elements of Theoretical Chemistry	
215. Advanced Inorganic Chemistry	3
216. Nuclear Chemistry	. 2
234. Chemical Instrumentation	. 2
251. Qualitative Organic Analysis	: 3
252. Advanced Organic Preparation	. 2
303. Thermodynamics	3
304. Physical Chemistry of Reactions	3
342. Advanced Organic Chemistry	2
350. Organic Reactions	2
352. Mechanisms of Organic Reactions	. 1
300. Forymer Chemistry	- 4
Civil Engineering	
Aleksandar Vesic, Director of Graduate Studies	
s	.н.
cE 201. Advanced Mechanics and Materialss	3
s	3

Economics and Business Administration

W. T. Yohe, Director of Graduate Studies

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201. Senior Seminar in Economics	. 3
204. Advanced Money and Banking	. 3
218. Business Cycles	. 3
219. Economic Problems of Underdeveloped Areas	. 3
231. Economic History of Europe	. 3
233. State and Local Finance	. 3
237-238. Statistical Methods	. 6
249. Product Markets	. 3
262. Trade Unionism and Collective Bargaining	. 3
268. Competition and Monopoly	. 3
273-274. Auditing, Theory and Practice	. 6
275-276. Advanced Industrial Accounting and Management	. 6
277. Income Tax Accounting	. 3
278. Advanced Problems in Income Taxation	. 3
279. Budgeting and Control	. 3
287. Public Finance	. 3
291. Business Policy	. 3
293. Economic Systems	. 3
294. Economic Functions of the State	. 3
295-296. Advanced Accounting Seminar—Theory and Practice	
301. Economic Analysis	. 3
304-305. Seminar-Money and Banking	
386. Seminar-Latin American Economic Problems	. 3
388. Seminar-Industrial Organization	
307-308. Quantitative Analysis	
311-312. History of Political Economy	. 6
313-314. Seminar—Economic Theory	. 6
315. Seminar–Economic Systems	
316. Seminar–Economic Functions of the State	. 3
317. Seminar—Demographic, Population, and Resource Problems	
319. Seminar–Theory and the Problems of Economic Growth and	. 0
Change	. 3
320. Seminar-Trade Cycles, Employment, and Income Theory	. 3
329. Federal Finance	. 3
330. Seminar-Public Finance	. 3
331. Seminar–Economic History	
340. National Income	
355. Seminar—Labor Economics	
358. Seminar—Labor Market and Related Analysis	. ა
365. Seminar—International Economics	• 3
366. Seminar-Problems in International Trade and Finance	. 3

389. Seminar—Industrial and Governmental Problems
Electrical Engineering
R. B. Kerr, Director of Graduate Studies
S.H.
EE 201. Energy Systems 3
Mathematics
S. L .Warner, Director of Graduate Studies
S.H.
221. Digital Computer3222. Introduction to Numerical Analysis3
233. Statistical Methods
234. Sampling Designs 3
244. Design of Experiments 3
283. Probability for Engineers
285. Applied Mathematical Methods I
286. Applied Mathematical Methods II
325-326. Real Variable
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Mechanical Engineering
J. B. Chaddock, Director of Graduate Studies
S.H.
ME 201. Theoretical and Applied Mechanics 3
ME 202. Theoretical Thermodynamics
ME 222. Analysis of Heat Transfer
Philosophy
Paul Welsh, Director of Graduate Studies
S.H.
241. Logic 3
Physics
E. G. Greuling, Director of Graduate Studies
S.H.
201-202. Mechanics 6 213-214. Contemporary Physics 6
217-218. Advanced Physics Laboratory
303-304. Thermodynamics and Statistical Mechanics

Political Science

J. H. Proctor, Director of Graduate Studies
S.H. 207. American Constitutional Law and Theory 3 241. Administrative Management 3
Loolog y
R. B. Nicklas, Director of Graduate Studies
S.H
203. Ecology
222. Entomology 4
238. Systematic Zoology 4
245. Radiation Biology 3 or 4
246. Molecular Biology
271. Cellular Physiology
274. Invertebrate Zoology
276. Protozoology 4
278. Invertebrate embryology

Enrollment 1966-67

Registered for the Master of Forestry Degree, 1967

Barerra, Carlos Emilio (For. Eng., National University of Colombia). Colombia, South America

Beattie, William David (B.A., Gettysburg College). Staten Island, New York Burgess, Robert Marshall (B.S., N. C. State University). Burlington, North Carolina Chambers, Alan David (B.S.F., University of British Columbia). Ontario, Canada Cox, David Royce (B.S., University of Idaho). Lewiston, Idaho

Cummings, James Allen (B.A., East Tennessee State College). Pulaski, Virginia Dean, Alan William (B.S., Pennsylvania State University). Freedom, Pennsylvania Eckstein, Louis Welsh (B.S., North Carolina State University). Bryson City, North Carolina

Espinoza, Francisco (Ing. For., University of Chile). Concepcion, Chile Finley, Charles Francis, Jr. (B.A., Gettysburg College). Richmond, Virginia Grods, John Modris (B.S., University of Washington). Longview, Washington Hadfield, James Stewart (B.S., University of Connecticut). Moosup, Connecticut Hart, Thomas Lester (B.S., Purdue University). Indianapolis, Indiana Hertel, Gerard Dennis (B.S., University of Montana). Old Greenwich, Connecticut King, Edgar Earl, Jr. (B.S., Auburn University). Andalusia, Alabama Largen, William Vincent (B.S., Auburn University). Durham, North Carolina Larsh, Robert Neal (B.S., Duke University). Durham, North Carolina Lindenboom, Ronald William (B.S., Drew University). Wayne, New Jersey Mirus, Earl Charles (B.S., New York State University). Clarence, New York Morgan, William Floyd, Jr. (B.S., University of Illinois). Normal, Illinois Mullin, Alexander George (B.S. in C.E., Duke University). Durham, North Carolina Polaski, Edward (B.S.F., West Virginia University). Pittsburgh, Pennsylvania Qudah, Musa Falah (Certificate from Cyprus Forestry College). Amman, Jordan Sharma, Eka Raj (B.Sc., Tri-Chandri College). Kathmandu, Nepal Sheldon, Sidney Carrol (B.A., East Tennessee State College). Williamsburg, Virginia Small, Richard Fred (B.A., Gettysburg College). Norristown, Pennsylvania Smith, Daniel Peter (B.A., Doane College). Florham Park, New Jersey Tanaka, Yasuomi (B.A., Tokyo University). Sumiko, Japan Tucker, Herbert Ray (B.S., University of the South). Bethel Springs, Tennessee Waddell, Thomas Edward (B.S., University of the South). McDonogh, Maryland Walstad, John Daniel (B.S., William & Mary College). Princeton, New Jersey Ward, James Gordon Denning (B.A., East Tennessee State College). Hampton, Tennessee

Warren, Bradley Hale (B.S., University of New Hampshire). East Barrington, New Hampshire

Wert, Philip Lester (A.B., Gettysburg College). Brogueville, Pennsylvania

Registered for the Master of Forestry Degree, 1968

Davidson, James Raymond (East Tennessee State College). Elizabethton, Tennessee Delill, Victoria Donna (Thiel College). Niagara Falls, New York Francis, Thomas Macoy (A.B., Wesleyan University). Radnor, Pennsylvania Gallegos, Carl Michael (A.B., Doane College). Silverton, Colorado Hain, Fred Paul (Stetson University). Deland, Florida Heintzelman, Richard George (Muhlenberg College). Neffs, Pennsylvania

McClure, Charles King, III (A.B., Trinity College). Louisville, Kentucky Terry, Thomas Anthony (West Virginia Wesleyan College). Mitchellville, Maryland

Registered for the Doctor of Forestry Degree

Anderson, Neil Hamilton (B.S., M.S., Clemson University). College Park, Texas Barnett, James Preston (B.S.; M.F., Louisiana State University). Alexandria, Louisiana Belt, George Harley, Jr. (B.S., North Carolina State University; M.F., Yale University). Moscow, Idaho

Box, Benton Holcomb (B.S.; M.S., Louisiana State University). Bogalusa, Louisiana DeBrunner, Louis Earl (B.S., University of Cincinnati; M.F., Yale University).

Auburn, Alabama

Douglass, Ross Swarens (B.S., North Carolina State University; M.F., Duke University). Raleigh, North Carolina

Gray, John Lewis (B.S.F., Pennsylvania State University; M.F., Yale University). Gainesville, Florida

Holt, William Robert (B.S.F.; M.S., Pennsylvania State University). Delaware, Ohio Lin, Jim Yung-huan (B.A., Taiwan; M.S., North Carolina State University). Taiwan,

O'Neal, Thomas Denny B.S., Southern Illinois University; M.F., Duke University). Bloomington, Indiana

Ronco, Frank, Jr. (B.S.; M.S., Colorado State University). Fort Collins, Colorado Thomas, Richard Joseph (B.S., Pennsylvania State University; M.S., North Carolina State University). Cary, North Carolina

Wahlgren, Harold Emil (B.S.; M.S., Iowa State University). Oregon, Wisconsin Wells, Garland Ray (B.S.F., Louisiana Polytechnic Institute; M.F., North Carolina State University). Knoxville, Tennessee

Students of Forestry in the Graduate School of Arts and Sciences

Armstrong, Frank Harris (B.S., West Virginia University; M.F., Yale University). Durham, North Carolina

Boyer, William Davis (B.S.; M.F., New York State University). Brewton, Alabama Cole, Alexander Beryl (B.S.; M.S., University of Missouri). Athens, West Virginia Dickison, Robert Bedford Bennett (B.S., Acadia University). Nashwaakis, N.B.,

Dutrow, George Fewell (B.S., M.F., Duke University). Washington, D.C.

Ham, Donald Lee (B.A., William Jewell College). East Peoria, Illinois

Hay, Ronald Leroy (B.S., Southern Illinois University; M.F., Duke University). Durham, North Carolina

Kaufmann, Merrill Ray (B.S., University of Illinois; M.F., Duke University). Durham, North Carolina

Meadows, John Crawford (B.S.F., Auburn University; M.S., Georgia Institute of Technology). Vidalia, Georgia

Mowbray, Robert Norman (A.B., Dartmouth College; M.F., Yale University). Baltimore, Maryland

Mowry, Fred Lear (B.S., Syracuse University). Syracuse, New York

Murphy, Charles Edward, Jr. (B.S., West Virginia Wesleyan; M.F., Duke University). Durham, North Carolina

Neumann, Francis Phillip (B.S., Pennsylvania State University; M.S., University of Minnesota). Stevenson, Maryland

Reid, Charles Phillip Patrick (B.S.F., University of Missouri; M.F., Duke University). Columbia, Missouri

Shoulders, Eugene (B.S.F., West Virginia University; M.F., Louisiana State University). Pineville, Louisiana

Sims, Herbert Percival (B.S.F., University of British Columbia; M.F., Yale University). Winnipeg, Manitoba, Canada

Stottlemyer, John Robert (B.S., Pennsylvania State University; M.S., University of Maryland). Blue Ridge Summit, Pennsylvania

Stubbs, Jack (B.S., Michigan State University; M.F., University of Minnesota). Charleston, South Carolina

van Kesteren, Frido (B.S., Pennsylvania State University; M.F., Duke University). The Hague, Holland

Wang, Yu-min (B.S., Taiwan University; M.F., University of British Columbia). Taiwan, China

Watt, Alan James (B.S., University of Sidney; M.F., Duke University). Wyong, Australia

Weatherspoon, Charles Phillip (B.S., University of Arizona). Tuscon, Arizona Wilkinson, Thomas George (B.S.; M.F., Duke University). Durham, North Carolina

Institutions Represented

Acadia University 1	Pennsylvania State University	
Auburn University 3	Purdue University	1
Clemson University 1	Southern Illinois University	2
Colorado State University 1	Stetson University	1
Cyprus Forestry College 1	Syracuse University	1
Dartmouth College 1	Taiwan University	2
Doane College 2	Thiel College	1
Drew University 1	Tokyo University	1
Duke University 12	Tri-Chandri College	1
East Tennessee State University 4	Trinity College	1
Georgia Institute of Technology 1	University of Arizona	1
Gettysburg College 4	University of British Columbia	3
Iowa State University 1	University of Chile	1
Louisiana Polytechnic Institute 1	University of Cincinnati	1
Louisiana State University 3	University of Connecticut	1
Michigan State University 1	University of Idaho	1
Muhlenberg College 1	University of Illinois	2
National University of Colombia 1	University of Maryland	1
New York State University College	University of Minnesota	2
of Forestry at Syracuse University . 2	University of Missouri	2
North Carolina State University 7	University of Montana	1

University of New Hampshire 1 University of Sidney 1 University of the South 2 University of Washington 1 Wesleyan University 1 West Virginia University 3	William and Mary College 1 William Jewell College 1 Yale University 6 TOTAL 51
Geographical Distribution	
United States	
Alabama 3 Arizona 1 Colorado 2 Connecticut 2 District of Columbia 1 Florida 2 Georgia 1 Idaho 2 Illinois 2 Indiana 2 Kentucky 1 Louisiana 3 Maryland 4 Missouri 1	New Jersey 3 New York 4 North Carolina 12 Ohio 1 Pennsylvania 7 South Carolina 1 Tennessee 4 Texas 1 Virginia 3 Washington 1 West Virginia 1 Wisconsin 1
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Australia 1 Canada 3 Chile 1 China (Taiwan) 2 Colombia 1 General Summary	Japan 1 Jordan 1 Nepal 1
Students in the School of Forestry Students of Forestry in the Gradua Total Enrollment Total number of Institutions Repre Total number of States Represented	



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DECEMBER

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BULLETIN OF DUKE UNIVERSITY

Undergraduate Instruction 1967



Annual Bulletins

For Bulletin of Information for Prospective Students, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The School of Engineering, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to The Dean of the Divinity School, Duke University, Durham, N. C.

For Bulletin of The School of Forestry, apply to The Dean of the School of Forestry, Duke University, Durham, N. C.

For Bulletin of The Graduate School of Arts and Sciences, apply to The Dean of the Graduate School, Duke University, Durham, N. C.

For Bulletin of The School of Law, apply to The Dean of the School of Law, Duke University, Durham, N. C.

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For Bulletin of The School of Nursing, apply to The Dean of the School of Nursing, Duke University, Durham, N. C.

For Bulletin of The Summer Session, apply to The Director of the Summer Session, Duke University, Durham, N. C.

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BULLETIN OF DUKE UNIVERSITY

Undergraduate Instruction 1967



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Calendar of the Colleges 1967-1968

September

Friday, 7:30 p.m.-Orientation begins: Assemblies for all new 15 students entering Trinity College, the Woman's College, the School of Engineering, and the School of Nursing

18 Monday—Registration and matriculation of all students of Trinity College, the Woman's College, the School of Engineering, and the School of Nursing, who have not pre-registered

Wednesday, 8:00 p.m.—University Convocation. Indoor Stadium 20

Wednesday-Final Registration of pre-registered students 20

Thursday, 8:10 a.m.—Fall semester classes begin 21

November

- Saturday—Last day for reporting six-weeks grades
- Pre-registration for Spring Semester 1967 13-16
 - Wednesday, 12:30 p.m.—Thanksgiving recess begins
 - Monday, 8:10 a.m.—Classes are resumed

December

- Sunday-Founders' Day
- Wednesday, 12:30 p.m.-Christmas recess begins

January

- Wednesday, 8:10 a.m.—Classes are resumed 3
- Saturday, 12:30 p.m.—Fall semester classes end
- Wednesday-Final Examinations begin 17
- Friday—Final Examinations end 26
- Tuesday—Registration and matriculation of new students 30
- Wednesday-Last day for matriculation for the spring semester 31

February

Thursday-Spring semester classes begin

March

- 13 Wednesday-Last day for reporting six-weeks grades
- 23 Saturday, 12:30 p.m.—Spring recess begins

April

- 1 Monday, 8:10 a.m.-Classes are resumed
- 8-11 Pre-registration for Summer Session and Fall Semester 1967

May

- 16 Thursday, 5:00 p.m.-Spring semester classes end
- 20 Monday-Final examinations begin
- 29 Wednesday-Final examinations end

June

- 1 Saturday-Commencement begins
- 2 Sunday-Commencement Sermon
- 3 Monday-Graduating Exercises

General Administration

Douglas Maitland Knight, Ph.D., Litt.D., LL.D., L.H.D., President R. Taylor Cole, Ph.D., Provost

Frank Leon Ashmore, A.B., Vice President for Institutional Advancement Gerhard Chester Henricksen, M.A., C.P.A., Vice President and Treasurer Everett Harold Hopkins, M.A., LL.D., Vice President for Planning and Institutional Studies, Assistant Provost

Charles B. Huestis, Vice President for Business and Finance
Frank Traver de Vyver, Ph.D., Vice Provost
Harold W. Lewis, Ph.D., Vice Provost
Richard Lionel Predmore, D.M.L., Vice Provost
Barnes Woodhall, M.D., Vice Provost
Craufurd David Goodwin, Ph.D., Assistant Provost
Robert H. Ballantyne, Ed.D., Assistant to the President for Planning
Benjamin Edward Powell, Ph.D., Librarian
Richard Lovejoy Tuthill, Ed.D., University Registrar
Rufus H. Powell, LL.B., Secretary of the University
Edwin Constant Bryson, LL.B., University Counsel

Undergraduate Administration

Mary Margaret Ball, Ph.D., Dean of the Woman's College James Lathrop Meriam, Ph.D., Dean of the School of Engineering James Ligon Price, Ph.D., Dean of Trinity College Ann M. Jacobansky, R.N., M.Ed., Dean of the School of Nursing



General Information

The University

Duke, a privately supported, church-related (Methodist) university, has about 7,400 students enrolled in nine schools and colleges. The students annually represent nearly every state and sixty-five foreign countries. There are now more than 40,000 alumni in seventy nations. The University is a member of the Southern Association of Colleges and Schools, and of the Association of American Universities, which consists of forty-one outstanding institutions.

The Undergraduate Colleges

Trinity College

Trinity College is responsible for the academic and social affairs of Duke undergraduate men in the arts and sciences. Its program is built around the development of a challenging, liberal curriculum, of honors work for able students, and effective academic counseling services. Cultural-intellectual cocurricular programs and a residential program combining faculty association with self-government are also a part of Trinity. While Trinity shares the Faculty of Arts and Sciences with the Woman's

College and the Graduate School, fifteen faculty members serve as Fellows of the College.

The Woman's College

The Woman's College combines the benefits of a small residential liberal arts college with those of a major university. As members of the residential College, students govern themselves and live within an eleven-unit house system on a well-defined portion of the larger campus. The residents of each house represent all four college classes, diverse geographical origins, and varying skills and intellectual interests. Many classes and most of the College activities center on the Woman's College (East) Campus; but women students share in a wide variety of academic, cultural, and social activities on the West (Men's) Campus. A shuttle bus between campuses assures accessibility to all points.

School of Engineering

The undergraduate program is designed to provide the opportunity for students to prepare for successful practice of the profession, for continuing personal cultural development, and for satisfying and responsible citizenship. Curricula are soundly based upon mathematics and the physical sciences; yet the engineering student also selects a number of courses in the liberal arts and is a member of a community with a liberal arts tradition. As a matter of policy, the School is relatively small, with an undergraduate enrollment of about 500. The undergraduate program receives the benefits of association with a strong graduate engineering program of instruction and research.

The Objectives of a Liberal Education

Woodrow Wilson described the objectives of a liberal education as "the wholly awakened man." Though the four years in college may not seem long enough to achieve this noble ideal, at the least they prepare one for the life-long awakening. A bachelor's degree is not an end, it is a beginning. Graduation, from the Latin word gradum, step, marks one more stride along the way.

The idea of a liberal education, like all great ideas, eludes precise definition, but in every age men have tried to express this abstraction by describing its results. They have always fallen short, because any definition is a system of limitations. For example, a nineteenth-century master

at Eton told his students:

You go to a great school not so much for knowledge as for arts and habits; for the habit of attention, for the art of expression, for the art of assuming at a moment's notice a new intellectual position, for the art of entering quickly into another person's thoughts, for the habit of submitting to censure and refutation, for the art of indicating assent or dissent in graduated terms, for the habit of regarding minute points of accuracy, for the art of working out what is possible in a given time, for taste, for discrimination, for mental courage and mental soberness.

-William Johnson Cory

This is helpful, but the questing student will surely wish for something further, something even more explicit about the abilities, attitudes, and customs essential to a liberal education.

At Duke University, as at every school dedicated to the liberal tradition, it is the faculty that must, in the final analysis, determine the specific content of the four-year curriculum offered for those who pursue a liberal education. And in constructing that curriculum, the faculty have taken into account these aims:

First, an educated man will acquire at least some experience in the three divisions of human knowledge and inquiry:

the world of nature—the physical and life sciences; the world of man in relation to man—the social sciences; the world of spirit and imagination—the humanities.

The objective is a man capable of thinking in the markedly different ways represented by these three divisions; for each of them he will familiarize himself with the appropriate method and idiom as well as the particular purpose and scope.

Second, an educated man will concentrate in one discipline to enjoy

the returns to be derived from intensive and specialized work.

Third, an educated man will learn to read his native language with ease and accuracy; what is more, he should develop a life-long desire to read avidly and with discernment.

Fourth, an educated man will master his native language with sufficient

skill to write it with vigor and precision.

Fifth, an educated man will read, write, and speak competently at least one foreign language. Apart from any utilitarian purpose it may serve, this objective leads to an understanding of a foreign culture and at the same time affords a fresh awareness of one's own tongue and society.

And finally, a liberally educated man will acquire historical, artistic, philosophical, and spiritual perspective. An exposure to the deeds and dreams of great minds in the unending struggle to reconcile power and principle, an awareness of the ways in which men have defined beauty, a knowledge of the best in ancient thought, and an appreciation of the values men have found in the Judaeo-Christian heritage must instill a contempt for the meretricious and the second-rate.

In short, a liberal education should help a man to know, to understand,

to decide, and to express: to know the facts or how to find them, to understand those facts with insight and perspective, to decide only after understanding and conscious evaluation, and to express those decisions with ease and grace. These are not the sum of a liberal education, but they go far to assist the wholly awakened man in his unceasing quest to live with dignity and sensitivity in our complex world and to participate in the values and common purposes that infuse our civilization.



Courses of Study and Requirements for Degrees

Within the framework of the four-year curricula offered in the undergraduate colleges of Duke University, the student has the major responsibility for devising and carrying through a course program appropriate to his goals and background. He will be assisted in this task by departmental Directors of Undergraduate Studies, Supervisors of Freshmen Instruction, Faculty Advisors, and by the academic Dean of his college.

Duke University offers in Trinity College and the Woman's College, courses of study which lead to the degrees of Bachelor of Arts and Bachelor of Science; and in the School of Engineering, the degree of

Bachelor of Science in Engineering.

Trinity College and the Woman's College

General Program

The General Program is designed for the student whose primary interest is in one of the liberal arts subjects. The subjects in which major work is offered are anthropology, art, botany, chemistry, economics, elementary education, English, French, geology, German, Greek, history, Latin, mathematics, music, philosophy, physical education for women,

physics, political science, psychology, religion, Russian, sociology, Spanish, and zoology.

Bachelor of Arts

The requirements for the degree of Bachelor of Arts are based on the principle that the student will derive the maximum benefit from his college work if his program includes a broad distribution of studies among representative fields of culture, concentration within a special field, and some work of his own choice.

For graduation with the degree of Bachelor of Arts, the following course work must be completed in accordance with the academic regulations as stated in this Bulletin.

Uniform Course Requirements	s.h.
English	6
Foreign Language	6-18
Natural Science	8
Formal Science	3
Religion	6
Social Science and History	12
Humanities	12
Physical Education	4
Major and Related Work	42
Electives to Make a Total of	124

These requirements are described in detail below.

English. 6 s.h. This requirement is met by the completion of English 1-2.

Foreign Language. The languages which meet this requirement are French, German, Greek, Latin, Russian, and Spanish. This requirement is fulfilled by one of the following: (1) a passing grade in French 64, German 92 or equivalent, Greek 106 or 108, Latin 92, Russian 64 or Spanish 64; (2) a satisfactory score on the placement test, plus a validating year (two literature courses numbered 90 or above); and (3) passing a proficiency examination. (The proficiency examination can be taken only by students who have been enrolled in language work in the University and is not available to entering Freshmen.) Students presenting for entrance four units of Latin may satisfy the language requirements by the completion of the third college year of Latin or two years of Greek.

Natural Science. 8 s.h. To satisfy this requirement a student must complete a laboratory course in one of the natural sciences (biology,

chemistry, geology, or physics).

Formal Science. 3 s.h. One course of at least 3 semester hours selected from mathematics (except Mathematics 51), logic, and scientific methodology (Philosophy 48).

Religion. 6 s.h. This requirement may be met in one of the following ways: (1) by completing, in the freshman year, Religion 1-2; (2) by completing, in the sophomore year or later, Religion 51-52; or (3) by completing, in the sophomore year or later, Religion 55 and one other course selected from those numbered 60-99; by completing Religion 105, fol-

lowed by 111, 121, 123, 152 or 175.

Social Science and History. 12 s.h. To satisfy this requirement a student must complete 12 semester hours in two departments from the following basic courses: Economics 1-2 or 51-52, 132, 149, 150, 154; History 1-2 or 51-52; Political Science 11-12 or 61-62, 121, 122, 123, 127, 131, 136, 155; Psychology 91, to be followed by either Psychology 100 or 101; or Sociology 91-92 or 93-94. (Double-numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

Humanities. 12 s.h. To satisfy this requirement a student must complete 12 semester hours from the following courses, with six hours in each of two divisions: (Double-numbered courses separated by a hyphen do

not meet this requirement unless both courses are completed.)

1. Literature: English 55-56, 57-58, 111-112, 125-126, 131-132, 137-138, 143-144; Classical Studies 111-112, 121-122; all foreign language literature courses above 100 not given in translation.

2. Philosophy 41-42, 93-94, 101, 109, 110, 111, 117, 119.

3. Art and Music: Art 51-52; Music 1-2, 51-52, 125, followed by 134, 139, 163, 164 or 165.

Physical Education. 4 s.h. Physical education is required during each of the first two years and is normally completed by the end of the sopho-

more year.

Major and Related Work. 42 s.h. The major work consists of 18 to 24 semester hours in one department above the introductory courses. Introductory courses consist of two one-semester courses in all departments except the departments of Economics and Business Administration, Classical Studies, German, Music, and Romance Languages in which the introductory courses may consist of four one-semester courses. The choice of courses must be approved by the major department. Whenever the department defines the major as 24 hours above the introductory courses, the student, with the prior approval of the Director of Undergraduate Studies, may substitute 6 hours of advanced work normally taken by a major in a related discipline during his junior or senior year. Eighteen hours of related work must be taken in two or more other departments and is selected subject to the approval of the major department and the Dean of the appropriate college; it may not include more than one course of 6 or 8 semester hours open primarily to freshmen. With the consent of the department, however, majors in mathematics, the natural sciences, and science education may include as related work introductory courses

in mathematics and the natural sciences. Although courses satisfying the uniform course requirements may also be counted toward the requirements in major and related work, no student may satisfy two uniform course requirements with the same course.

Electives. In addition to the uniform courses required and the major and related work, other courses must be completed to make a total of at

least 124 semester hours.

Students whose courses of study permit may elect a maximum of 18 semester hours in engineering, forestry, or medical science. The courses elected in these subjects must be approved by the major department and the Dean of the appropriate college.

Bachelor of Science

For graduation with the degree of Bachelor of Science, the following course work must be completed in accordance with the academic regulations as stated in this Bulletin.

Uniform Course Requirements	s.h.
English	6
Foreign Language 8	3-24
Mathematics	6
Natural Science	8
Social Science and History	6
Religion	6
Humanities	6
Physical Education	4
Major and Related Work	48
Electives to Make a Total of	124
These requirements are described below.	

English. 6 s.h. This requirement is met by the completion of English

Foreign Language. Bachelor of Science candidates must complete the second college year, or equivalent as determined by examination, of one foreign language, and the first college year of another. For each departmental major, see a listing of the foreign languages acceptable for the B.S. degree.

Mathematics. 6 s.h. This requirement may be met by completion of

Mathematics 21 and 22.

Natural Science. 8 s.h. This requirement can be satisfied by courses in one of the natural sciences, namely, biology, chemistry, geology, or physics. The courses must include laboratory work.

Social Sciences and History. 6 s.h. This requirement can be satisfied by the following: Economics 51-52, 132, 149, 150, 154; History 1-2 or 51-52; Political Science 11-12 or 61-62, 121, 122, 123, 127, 131, 136, 155; Psychology 91, to be followed by either Psychology 100 or 101; Sociology 91-92 or 93-94. (Double-numbered courses separated by a hyphen do not meet

this requirement unless both courses are completed.)

Religion. 6 s.h. This requirement may be met in one of the following ways: (1) by completing, in the freshman year, Religion 1-2; (2) by completing, in the sophomore year or later, Religion 51-52; and (3) by completing, in the sophomore year or later, Religion 55 and one other course selected from those numbered 60-99; by completing Religion 105, followed by 111, 121, 123, 152 or 175.

Humanities. 6 s.h. This requirement can be satisfied by 6 hours from the following: English 55-56, 57-58, 111-112, 125-126, 131-132, 137-138, 143-144; Classical Studies 111-112, 121-122; all foreign languages literature courses above 100 not given in translation; Philosophy 41-42, 93-94, 101, 109, 110, 111, 117, 119; Art 51-52; Music, 1-2, 51-52, 125, followed by 134, 139, 163, 164 or 165. (Double-numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

Physical Education. 4 s.h. Physical education is required during each of the first two years and is normally completed by the end of the

sophomore year.

Major and Related Work. 48 s.h. Major and related work consists of at least 48 semester hours in the natural sciences. This work must be selected from the departments of botany, chemistry, geology, mathematics, physics, psychology, and zoology. The major work consists of a minimum of 18 semester hours in one department above the introductory courses. The choice of courses is subject to the approval of the department. Whenever the department defines the major as 24 hours or more above the introductory courses, the student, with the prior approval of the Director of Undergraduate Studies, may substitute 6 hours of advanced work normally taken by a major in a related discipline during his junior or senior year. The related work is taken in at least two other departments and is selected subject to the approval of the major department. With the consent of the department, majors in mathematics and the natural sciences may include as related work introductory courses in mathematics, the natural sciences, and science education. A minimum of 14 semester hours of related work is required, 8 hours of which must be in laboratory science. Although courses fulfilling the uniform course requirements may also be counted toward the requirements in major and related work, no student may satisfy two uniform course requirements with the same course. For the major in science education leading to the B.S. degree, see p. 12.

Electives. In addition to the above, the student must elect a sufficient number of courses to complete the 124 semester hours necessary for graduation.

Students whose courses of study permit may elect a maximum of 18 semester hours in engineering, forestry, or medical science. The courses

elected in these subjects must be approved by the major department and the Dean of the college.

Specialized Programs

A student who has chosen a particular field may wish to take more course work in a major or related discipline than is required by his major department. The following programs of study offer a guide in planning this work, especially as it applies to preparation for various professions or professional schools.

Undergraduate Programs

Accounting. A student may specialize in public or industrial accounting in his Junior and Senior years. In either case the following courses should be taken in the freshman and sophomore years:

Freshman Year

Mathematics 17 or 21. (preferably Mathematics 21), Economics 1 and 2

Sophomore Year

Economics 51-52 (If Economics 1 and 2 not taken in Freshman year) 57-58, 138.

Public Accounting. The following sequence of courses includes more than the requirement for a major in accounting. It is, however, a suggested list of courses which meet the current requirements of the North Carolina Board of Certified Public Accountants.

Junior Year

Ec. 143-Corporation Finance

Ec. 146—Managerial Economics

Ec. 171—Accounting Theory

Ec. 172-Corporate Accounts

Ec. 181-Business Law

Ec. 182—Business Law

Senior Year

Ec. 273, 174-Auditing Theory and Practice

Ec. 275, 276-Advanced Industrial

Accounting and Management Ec. 277—Income Tax Accounting

Ec. 277—Income Tax Accounting
Ec. 295—Advanced Accounting Semi-

Election of one of the following: (either year)

nar

Ec. 178-Accounting Systems

Ec. 180-Governmental Accounting

Ec. 184-Commercial Law for Accountants

Ec. 278-Advanced Problems in Income Taxation

Ec. 279-Budgeting and Control

Ec. 296-Advanced Accounting Seminar

Industrial Accounting. The following courses are suggested:

Junior Year

Ec. 143—Corporation Finance Ec. 146-Managerial Economics

Ec. 171—Accounting Theory

Ec. 172-Corporate Accounts

Senior Year

Ec. 273-Auditing, Theory and Prac-

Ec. 275, 276-Advanced Industrial Accounting and Management Ec. 277-Income Tax Accounting

Ec. 291—Business Policy

Biology—Interdisciplinary Programs. Modern biology meets and joins forces with many related fields. Examples of such interdisciplinary areas are: biomathematics, microbiology, molecular biology, oceanography, and psychobiology. Proper training for these and other areas may require work in two or several science disciplines to such depth that requirements for a conventional uni-departmental major program cannot be met in the allotted time. Any undergraduate who contemplates undertaking a graduate program in an interdisciplinary area involving biology should consult with the directors of undergraduate study of the fields concerned. They may, by joint consent, approve of major-related programs which differ from those concerned primarily with a single discipline. An interdisciplinary major student shall be considered a major in the department of his choice and be under the supervision of the Director of Undergraduate Studies of that department. Interdisciplinary programs must be planned early in the undergraduate career, preferably starting with the freshman year.

Business. A specialized program is offered to students planning to enter business. A student electing this program must take, in addition to the uniform course requirements, the following courses in the sequence indi-

cated.

Freshman Year

Mathematics 17 or 21 (preferably Mathematics 21) Economics 1 and 2

Sophomore Year

Economics 51 and 52 (If Economics 1 and 2 not taken in Freshman

Economics 57, 58, Economics 138

Junior Year

Economics 143, Economics 146, *Economics elective

Senior Year

*Economics Elective, Economics 291

These electives must be chosen from the following courses: Economics 144, Economics 185, Economics 190, Economics 249

Music Education. The following course sequence is designed for prospective teachers of high school instrumental or vocal music. Although it includes more than the number of hours required for a major in music, it represents those courses recommended by the Music Department for state certification: Music 51-52, 65-66, 115-116, 121-122, 147-148, 3 additional semester hours in Music Literature, and 18 semester hours in Applied Music.

Other areas of concentration in music are described on pages 129-135 of this *Bulletin*.

Teaching. Duke University is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers. The University's programs are also approved

by the North Carolina Department of Public Instruction.

The program for students who intend to teach is designed to prepare for positions either in elementary or secondary schools. All prospective teachers must take Psychology 91, preferably during the sophomore year, and Education 100 or 113, preferably during the junior year. Only students with an average of 2.0 overall and in their major or teaching fields will be admitted to student teaching. Special methods courses should be taken prior to undergraduate student teaching, which may be done *only* in the senior year.

Whatever their majors, students should consult an appropriate member of the Department of Education prior to each registration period to assure their meeting the certification requirements of the states in which they wish to teach and having places reserved for them in student teach-

ing

Elementary-School Teaching. Students preparing to teach in the elementary school must complete the following specific requirements in addition to Psychology 91 and Education 100 or 113: Education 101, 102, 105, 106, 107, 108, 118, and 161; Art 51-52; Economics 115 or 120; Health Education 134; History 91, 92; Mathematics 17 or 21; Music 151, 152; Physical Education 102; Political Science 61; and a biological science, 3 s.h. (Biology 1-2 will satisfy this requirement and minimum uniform requirements in natural science as well. Other courses listed above also may meet certain of the other minimum uniform requirements.) Students preparing to teach in the elementary school also must develop a nine to twenty-one semester-hour field of concentration in addition to the foregoing requirements.

Secondary-School Teaching. Students preparing to teach in a secondary school may meet certification requirements by qualifying in one teaching subject. Prospective secondary-school teachers must major in a subject other than education. Qualification for certification to teach a single science may be sought under either the A.B. or the B.S. degree. Students desiring to major in Science Education should read carefully the descrip-

tion of that program given below.

Science Education Major. Students who intend to teach sciences in the high school may major in Science Education. The program is designed to meet certification requirements and to provide the broad background of preparation in the sciences which is needed by science teachers. Students planning to enter this program should consult an adviser in the Department of Education and in one of the science departments. The basic requirements are: Education 100, or 113, 118, 215, 216, and 276 or 246; Mathematics 21 and 22; Sciences (botany, chemistry, geology, physics, zoology, and mathematics courses numbered above 22), 42 s.h., of which 15 must be above introductory level and must include one year's study in laboratory courses in three of the following: botany or zoology, chemistry, physics, and geology.

The same major program may be followed for both the B.S. and B.A.

degrees.

Preparation for Graduate and Professional Schools

Many graduate and professional schools require special tests for students seeking admission. Information regarding the test requirements should be obtained from the catalogue of the schools to which the student plans to apply. The University Counseling Service has available applica-

tions for required graduate and professional testing programs.

Graduate School. The student who plans to enter a graduate school of arts and sciences for advanced study should consult an adviser in the field of the proposed advanced study concerning suitable preparation. Most graduate schools have definite requirements in foreign languages for all students. Candidates for the degree of Doctor of Philosophy are required to pass reading examinations, usually in German and French. In some cases other languages may be substituted. As soon as practicable, the student should ascertain the requirements of the particular graduate school he desires to enter.

Medical and Dental Schools. Students planning to enter a medical or dental school should arrange their programs of study from the first semester so as to include those courses required by the professional schools of their choice. These courses usually include two years of English, two years of chemistry, and one year each of biology, mathematics, and physics. At Duke University the courses normally taken are English 1-2 and 55-56 or 57-58, Chemistry 1, 2, 61, 151, and 152, Biology 1 and 2, Mathematics 21-22, and Physics 41-42. Most professional schools require ninety semester hours of college credit before consideration for admission. Because individual medical and dental schools strongly recommend or, in some cases require specific courses in addition to those listed above, it is wise for the student to be fully aware of any additional requirements established by the professional school of his choice.

The minimum uniform course requirements and those of the major

and its related work for either the A.B. or B.S. degree must be fulfilled for graduation. The latter requirements are described for each department under Courses of Instruction in this *Bulletin*. Each student may elect to major in the department of his choice, but should understand that even with careful program planning starting his first semester, it may be necessary to exceed the 124 semester hours required for graduation.

Law Schools. Students who plan to prepare for law school may select their major work in any field. They have often chosen the following

courses:

Economics 51, 52, 57, 58. English 55, 56. History 1, 2 or 51, 52, 105, 106. Philosophy 48 and 41. Political Science 61-62. Sociology 91, 92.

Theological Schools and Religious Work

The Divinity School of Duke University publishes as its own the official policy statement of the American Association of Theological Schools respecting undergraduate preparation for students expecting to enroll in

graduate professional theological studies.

"The student contemplating theological study should correspond at the very earliest opportunity with the school or schools to which he intends to apply and with the authorities of his church in order to learn what will best prepare him for the specific program he expects to enter. He will be likely to find under the guidance of the seminary that he should consider

the following subjects:

"English language and literature; history, including non-Western cultures as well as European and American; philosophy, particularly its history and its methods; natural sciences, both the physical and the life sciences; social sciences, where psychology, sociology, and anthropology are particularly appropriate; the fine arts and music, especially for their creative and symbolic values; Biblical and modern languages; religion, both in the Judaeo-Christian and in the Near and Far Eastern traditions.

"Some seminaries require Greek or Hebrew for admission, and many advanced biblical courses are offered in the original tongues; modern languages have a less direct but immensely educative role and are required at the graduate studies level.

"It is the understanding gained in these fields rather than the total of

credits or semester-hours which is significant.

"In many seminaries students who have been well prepared in religion and equipped with the tools of theological study will be set free, not to complete their theological course more quickly, but rather to pursue

more advanced studies. The principle constantly to be kept in mind is not that of satisfying paper regulations and minimum requirements, but of making the most of opportunities for education."

Professional Combination Courses

The provision whereby a senior may elect the work of the first year in a professional school of the University shall apply solely to eligible students in Trinity College or the Woman's College. The privilege of completing a combined course for the degree is conditioned upon admission to the professional school at the close of the junior year. A student thus admitted registers as a senior in college and as a first-year student in

the professional school.

Forestry. Preprofessional training in forestry is offered to students of Trinity College who are planning careers in professional forestry. A student who has completed the three-year program of studies in the liberal arts and sciences outlined below, and who has earned an average grade of C or higher (exclusive of physical education) may, with the approval of the Deans of Trinity College and the School of Forestry, respectively, transfer to the School of Forestry. Upon the satisfactory completion of the forestry courses required in the first year in the School of Forestry (see Bulletin of the School of Forestry), the student will be eligible for the degree of Bachelor of Science from Trinity College, Duke University.

The professional degree of Master of Forestry may be earned upon satisfactory completion of the work of the second year in the School of

Trinity College students in this combination are encouraged to consult with the special adviser for students in Forestry Combination Program. The name of this adviser may be obtained at the School of Forestry office.

Law. A student who has completed, with an average grade of C, 96 semester hours of undergraduate work, including the uniform course requirements for the degree of Bachelor of Arts and the work of the junior year in his major and related fields, may, with the approval of the dean of the college, transfer to the Duke University School of Law and be eligible for the degree of Bachelor of Arts from Duke University upon the satisfactory completion therein of the work of the first year.

It is understood that this provision shall apply solely to eligible undergraduates who have completed three years in residence in Duke University, and that not less than the full first-year's work of the Law School will

be acceptable for credit towards the bachelor degree.

No single discipline or program of study can be described as the best preparation for the study of law since there are various methods of approach to legal study.

Completion of the undergraduate work necessary to qualify for the Law Combination Program does not insure admission to the Duke University School of Law, nor impose any restriction whatever upon its freedom in selecting students for admission. Students wishing further information are invited to consult with the Dean of the School of Law.

School of Engineering

Bachelor of Science in Engineering

Beginning with the entering class in September, 1965, the School of Engineering offers a four-year program leading to the degree of Bachelor of Science in Engineering, with opportunity for majors in the professional fields of civil, electrical, or mechanical engineering, as well as for programs planned in interdisciplinary fields such as bioengineering, engineering mechanics, energy conversion, materials, systems and controls, and the like.

For graduation with a bachelor's degree in engineering, a minimum of 134° semester hours of course work must be completed and include the following:

English. 6 s.h. This requirement is met by the completion of English 1-2.

Mathematics. 15 s.h. This requirement is met by completion of Mathematics 21, 22, 63, 64, and 111.

Natural Science. 16 s.h. This requirement is met by completion of

Chemistry 1 and 2 and Physics 41 and 42.

Social Sciences and History. 6 s.h. This requirement may be satisfied by one of the following 6-hour sequences; Economics 1-2, or 51-52; History 1-2, or 51-52; Political Sciences 11-12 or 61-62; Psychology 91, to be followed by either Psychology 100 or 101; Sociology 91-92, or 93-94.

Humanities. 6 s.h. This requirement may be satisfied by 6 hours from the following: English 55-56, 57-58; Greek 121, 122; Latin 111, 112; all foreign language literature courses above 100 not given in translation; Philosophy 41-42, 93-94; Art 1-2, 51-52; Music 1-2, 51-52; Religion 1-2 or 51-52, 55, courses numbered 60-99.

Electives in Social Science, History, and Humanities. 6 s.h. In addition to the above, the student must elect a minimum of 6 semester hours of

courses in social sciences, history, or humanities.

Elective. 3 s.h. To be selected in consultation with adviser.

Physical Education. 4 s.h. Physical education is required during each

^o Reserve Officers Training Programs. A maximum of 6 hours of junior or senior level Air Science or Naval Science course work may be counted in satisfying the minimum requirements of 134 hours for a baccalaureate degree in engineering. These 6 hours may not be substituted for any of the above requirements in English, Social Sciences and History, Humanities, or electives in Social Sciences, History, and Humanities. All other credits earned in Air Science or Naval Science are taken in addition to the minimum program.

of the first two years and is normally completed by the end of the sopho-

Departmental or Major Specifications. 37 s.h. In addition to the above requirements, 37 hours of courses in the third and fourth year are specified by the engineering department or interdepartmental major in which the student is registered. A minimum of 16 hours of the 37 must be engineering courses of which 6 hours must be design-oriented studies.

Engineering Core Courses. 35 s.h. The normal engineering program includes 35 hours of engineering core courses and is met by completion of Engineering 1, 2, 23, 53, 63, 73, 83, 101, 113, 123, 133, 143, 163. Under special circumstances, a minimum of 10 hours of the normally required 16 hours of common-core engineering courses from the third- and fourth-

year programs may be approved.

To provide the engineering student with the necessary background in fundamentals upon which a variety of engineering programs of study can be based, and to relieve him of the necessity of committing himself immediately to a specific major branch of engineering, a common core of courses is provided for the freshman, sophomore, and part of the junior years.

Common-Core Program of Studies for the Degree of Bachelor of Science in Engineering

	Liegitiit	un Icui	
First Semester	s.h.	Second Semester	s.h.
Chem. 1-Gen. Inorg. Chemi	is-	Chem. 2-Gen. Inorg. Chemis-	
try	4	try	. 4
Engrg. 1-Engineering Design	gn	Engrg. 2—Engineering Design	
I	2	II	. 2
Approved elective	3	Engrg. 23—Statics	. 3
Engl. 1-English Composition	n . 3	Engl. 2—English Composition	. 3
Math. 21-Introductory Calcu		Math. 22-Introductory Calcu-	
lus	3	lus	. 3
P.EPhysical Education	1	P.E.—Physical Education	. 1

Freehman Vear

Sophomore Year

	First Semester	s.h.	Second Semester	s.h.
††Engrg.	73-Mechanics of	De-	††Engrg. 53-Engineering Desig	n
formal	ole Bodies	3	III	
††Engrg.	83-Structure & P	rop-	††Engrg. 63—Introductory Elec	-
erties	of Solids	3	tric Systems I	. 4
			· · · · · · · · · · · · · · · · · · ·	

†Freshman engineering students taking Air Science or Naval Science should schedule certain courses in addition to the 16 semester hours prescribed.

††The combination of Engrg 73 and 83 is interchangeable with the combination of Engrg 53 and 63.

16t

Humanities-Social Studies	Humanities-Social Studies
Elective 3	Elective 3
Math. 63—Intermediate Calcu-	Math. 64—Intermediate Calcu-
lus 3	lus
Phys. 41—General Physics 4	Phys. 42—General Physics 4
P.E.—Physical Education 1	P.E.—Physical Education 1
17	17

Junior Year

First Semester s	.h.	Second Semester s.	h.
**Engrg. 113—Introductory		**Engrg. 123—Dynamics	3
Electric Systems II	3	**Engrg. 143—Fluid Mechanics .	2

°° Engrg 113 and Engrg 123 are interchangeable; Engrg 133 and Engrg 143 are interchangeable.



°Engrg. 133—Heat Transfer 2 Engrg. 101—Thermodynamics . 3 Humanistic-Social Studies Elective 3 Math. 111—Applied Math	‡Engrg. 163—Fields 3 or o Humanistic-Social Studies Elective
Analysis I 3 ‡‡Departmentally Specified	$\frac{\ddot{}}{17}$
Course 3	

Senior Year

First Semester	s.h.	Second Semester	s.h.
Humanistic-Social Studies		Humanistic-Social Studies	
Elective	3	Elective	3
‡‡Departmentally Specified		‡‡Departmentally Specified	
Courses	14	Courses	. 14
	17		17

Program of Study in Civil Engineering for the Bachelor of Science in Engineering Degree

This program became effective with the class that entered in Sept., 1965.

For uniform freshman and sophomore program see page oo.

Iunior Year

First Semester	Second Semester
s.h.	s.h.
△*Humanistic-Social Studies	△*Humanistic-Social Studies
Elective 3	Elective 3
*Engrg. 113 Introductory	*Engrg. 101 Thermodynamics . 3
Electric Systems II 3	*Engrg. 133 Heat Transfer 2

May be scheduled in semester 6, 7, 8, or 9.

‡‡To be taken from approved programs in professional fields of civil, electrical, or mechanical engineering. Work may also be arranged in interdisciplinary fields such as bioengineering, engineering mechanics, energy conversion, materials, systems and controls and the like.

Δ Part of a program of electives planned with departmental approval to suit the interests and abilities of the individual student. The program will include a minimum of 6 semester hours of either economics or political science. The program will also include a minimum of 9 semester hours in mathematics, the natural sciences, or other technical subjects. English 93 will normally be part of these 9 semester hours.

*Common-Core Courses.

*Engrg. 123 Dynamics 3 *Engrg. 143 Fluid Mechanics . 2 *Math. 111 Applied Math Anal. I 3 C.E. 131 Structural Mech. I . 3	C.E. 96 Measurements 3 C.E. 123 Hydraulic Engrg 3 △Approved Elective
--	--

Senior Year

First Semester	Second Semester
s.h.	s.h.
△ *Humanistic-Social Studies	△*Humanistic-Social Studies
Elective 3	Elective 3
C.E. 118 Materials 2	C.E. 116 Transportation 3
C.E. 124 Sanitary Engrg 3	C.E. 134 Struct. Design II 3
C.E. 133 Structural Design I . 3	C.E. 150 Engrg. Systems 2
C.E. 139 Soil Mechanics 3	Δ Engrg. 163 Fields 3
△Approved Elective 3	△Approved Elective 3
17	17

Under special circumstances, a minimum of 22 semester hours of the normally required 28 semester hours of Civil Engineering courses may be approved by the Director of Undergraduate Studies.

Program of Study in Electrical Engineering for the Bachelor of Science in Engineering Degree

This program became effective with the class that entered in September, 1965.

For uniform freshman and sophomore program see page 17.

Iunior Year

First Semester	Second Semester
s.h.	s.h.
△ *Humanistic-Social Studies	* △ Humanistic-Social Studies
Elective 3	Elective 3
*Engrg. 113 Introd. Electric	.*Engrg. 101 Thermodynamics . 3
Systems II 3	*Engrg. 133 Heat Transfer 2

*Common-Core Courses.

ΔPart of a planned program of electives to be chosen in consultation with the

Δ Engrg. 163 may be delayed to the first semester of the fifth year (see Engineering Bulletin).

Math. 111 Appl. Math Anal.	Math 111 3	
I 3	E.E. 161 Electronics and	
Phys. 161 Modern Physics 3	Signals 3	
17	17	
·	-7	
0 1 27		
Senior Year		
First Semester	Second Semester	
s.h.	s.h.	
* △ Humanistic-Social Studies	* △ Humanistic-Social Studies	
Elective 3	Elective 3	
E.E. 162 Electromechanical	E.E. 167 Design Colloqui-	
Energy Conversion 2	um 2	
E.E. 163 Physical Elec-	ΔE.E. Elective 3	
tronics 3	△Approved Elective 3	
E.E. 164 Electromagnetic	△Approved Elective 3	
Fields and Waves 3	△Approved Elective 3	
△Approved Elective 3	$\frac{3}{17}$	
△Approved Elective 3	*/	
11		
1/		
Program of Study in Mechanical Engineering for the Bachelor of Science in Engineering Degree		
This program became effective with the class that entered in September,		
1965.		
For uniform freshman and sophomore program see page oo.		
Junior Year		
First Semester	Second Semester	
s.h.	s.h.	
Δ*Humanistic-Social Elective . 3	Δ*Humanistic-Social Elective . 3	
*Engrg. 123 Dynamics 3	*Engrg. 113 Introductory Elec-	
*Engrg. 101 Thermodynamics . 3	tric Systems II 3	
*Engrg. 143 Fluid Mechanics . 2	*Engrg. 133 Heat Transfer 2	
*Math. 111 Applied Math.	Math. Elective Beyond Math.	
Anal. I 3	111 3	
M.E. 133 Mechan. Design I . 3	M.E. 102 Thermo II 3	
	Phys. 161 Modern Physics 3	
17	17	
***	1/	

Δ Part of a planned program of electives to be chosen in consultation with the

*Engrg. 163 Fields 3 Math. Elective beyond

Math 111 3 E.E. 161 Electronics and

°Engrg. 123 Dynamics 3 °Engrg. 143 Fluid Mechanics . 2 °Math. 111 Appl. Math Anal.

*Common-Core Courses.

Advisor.

Senior Year

First Semester	Second Semester
s.h.	
△*Humanistic-Social Studies	△*Humanistic-Social Studies
Elective 3	Elective 3
M.E. 134 Mechanical Design	M.E. 161 Mech. Engrg. Lab 2
II 2	M.E. Design Elective 3
M.E. 136 Response of Sys-	M.E. Elective 6
tems 3	△Approved Elective 3
M.E. Elective 6	17
△Approved Elective 3	-/
17	

 $\Delta \operatorname{Part}$ of a planned program of electives to be chosen in consultation with the Advisor.

*Common-Core Courses.

Interdisciplinary Major

This major would parallel the majors in civil, electrical, and mechanical engineering and, subject to faculty approval, would be offered in areas such as bioengineering, engineering mechanics, energy conversion, materials, and systems and controls.

The following requirements would govern the interdisciplinary major:

- 1. The program shall meet the requirements of the Bachelor of Science in Engineering degree as outlined on the preceding pages, and shall in addition contain the requirements:
 - (a) A minimum of 16 s.h. of engineering course work in addition to common-core courses must be taken in the third and fourth years, of which 6 s.h. must be design-oriented studies.
 - (b) Limitation shall be placed on the amount of work which can be taken in a given department during the third and fourth years so that the advantages of interdisciplinary studies may be realized.
- Each student enrolled in an approved interdisciplinary program shall be assigned to an appropriate engineering department of administrative purposes.

Special and Cooperative **Programs**

Reserve Officers Training Corps

Through the Naval and Air Force Reserve Officers Training programs the University is cooperating with the Department of Defense in providing well-educated officers for the regular and reserve forces of the Nation.

The Naval Reserve Officers Training Corps

There are two basic programs through which students can qualify for Naval commissions upon graduation; one, the Regular Naval Reserve Officers Training Corps program, which provides a maximum of four years in the University largely at government expense, followed by a commission in the regular Navy or Marine Corps; the other, the Contract program, which leads to a commission in the Naval Reserve or the U.S. Marine Corps Reserve.

The Regular Student. Quotas are awarded on the basis of an annual nation-wide test and selection procedure. Students selected are appointed Midshipmen, USNR, and receive four years tuition, fees, and textbooks at government expense plus subsistance pay and summer active duty pay totaling approximately \$750 per year. The regular midshipman may take any course leading to a baccalaureate or higher degree with certain exceptions, e.g., pre-medicine and medicine, pre-theological and theological, music and art. His academic program must include 21 semester hours of Naval Science, 3 semester hours of General Psychology, one year of college physics and one year of college mathematics. The Naval Science requirement is reduced to 15 semester hours for students who are awarded Engineering Degrees upon graduation; Naval Engineering is waived and, in lieu of Naval History (NS 102, 3 s.h.), the Engineering student is required to take Naval History and Elementary Strategy (History 99, 3 s.h.). The Regular midshipman participates in two summer training cruises aboard ship and receives aviation and amphibious indoctrination at naval shore stations for one summer. Upon graduation he receives a commission as Ensign in the Regular Navy, or Second Lieutenant in the Regular Marine Corps, after which he serves with the Navy or Marine Corps, as required by the Secretary of the Navy in the same manner as his officer contemporaries who are graduates of the U.S. Naval Academy. The minimum period of commissioned service is four years for regular officers.

The Contract Student. The contract student is selected from those regularly enrolled freshmen in Duke University who desire to qualify for a commission in the Naval or Marine Corps Reserve while pursuing normal courses of study. Since he will be ordered to three years active duty immediately on graduation and commissioning, the Navy does not recommend that a medical, dental or theological student apply for this program. He must include in his academic program mathematics through trigonometry (if not successfully completed in secondary school), or one semester of college mathematics, 3 semester hours of General Psychology, and 21 semester hours of Naval Science. The Naval Science requirement is reduced to 15 semester hours for students who are awarded Engineering degrees upon graduation; Naval Engineering is waived and, in lieu of Naval History (NS 102, 3 s.h.) the Engineering student is required to take Naval History and Elementary Strategy (History 99, 3 s.h.) He has the status of a civilian who has entered into a mutual contract with the Navy and is not eligible for the benefits and pay received by regular midshipmen. He receives subsistence pay of \$40 a month during his last two years in the NROTC. He goes aboard ship for one summer training cruise, normally between his junior and senior years. Upon graduation, he is commissioned in the Naval or Marine Corps Reserve and reports for a minimum of three years active duty. Upon completion of the minimum active service requirements he may request transfer to the regular component of the Navy or Marine Corps, retention on active duty as a reservist, or transfer to the inactive reserve.

Limited numbers of non-NROTC students who are in good standing after completion of their sophomore year may, after successful completion of a special six week summer training session, be enrolled as contract students at the commencement of their junior year.

Both Regular and Contract midshipmen are deferred from Selective Service by virtue of their commitment to serve on active duty after graduation. The Navy furnishes necessary uniforms and equipment. Uniforms are worn only on drill days or other special occasions when prescribed by the Professor of Naval Science. Regular and Contract students receive the same instruction and wear the same uniforms. No distinction is made between the two in the NROTC Unit. Contract students may compete each year for the Regular Program, and if selected, they will be appointed to Regular status with the attendant benefits and pay.

The Air Force Reserve Officers Training Corps

This unit functions as a regular department of instruction known as the Department of Air Force Aerospace Studies. It selects, trains, and commissions college men who desire to serve in the United States Air Force.

For enrollment in the General Military Course (freshman and sophomore years) the student must be accepted by the institution as a regularly enrolled student; must successfully complete such general survey and screening tests as may be prescribed; and must sign a loyalty certificate with the U.S. Government. Students initially entering the University who have had previous preparatory or high school military training are normally accepted in the General Military Course at the same academic level as that in which they are accepted by the University. The student may elect to attend a six weeks Field Training Course conducted at selected Air Force Bases instead of enrolling in the General Military Course. If he choses this option he will report to the Field Traning Unit during the summer between his sophomore and junior years. To be eligible for continuation, or initial enrollment, in the Professional Officer Course (junior and senior years), a person must:

1. be a citizen of the United States;

2. be selected for advanced training under Air Force procedures;

3. enlist in the United States Air Force Reserve;

4. contract, with the consent of his parent or guardian if he is a

minor, to complete the program of advanced training;

5. agree in writing that he will accept a commission in the United States Air Force, and that he will serve in the Air Force for the period prescribed by the Secretary of the Air Force;

6. complete successfully:

a. the General Military Course; or

b. six weeks of summer Field Training; or

c. have had prior honorable service in the Armed Forces of the United States. Students who qualify for the Professional Officer Course by successfully completing the General Military Course must attend

four weeks of Field Training between their junior and senior years. Students must also agree to take orientation flights when offered; must be less than 28 years of age at the time of graduation; and must successfully complete such general survey and screening tests as may be prescribed and must be selected by the Professor of Aerospace Studies and the appropriate authority of the University.

During the second semester of their sophomore year, cadets who are participating in the General Military Course may indicate their desire to receive tuition assistance upon entry into the Professional Officer Course. Such assistance is awarded on a merit basis by a joint departmental and university selection board. Cadets who are selected for tuition assistance will receive tuition, books, laboratory fees, and travel reimbursement to and from their home residence at government expense and subsistence of \$50.00 per month.

Students in the General Military Course may be deferred from Selective Service upon satisfactory completion of one semester of Aerospace Studies. Advanced students are deferred as soon as they are formally

enrolled in the Professional Officer Course.

For students who are not selected for tuition assistance all uniforms, texts, and training equipment are furnished at government expense, and are paid a total of approximately \$900.00 for the two years of the Professional Officers Course.

A thirty-five hour Flight Instruction Program using light aircraft is restricted to seniors who may, upon completion of the course, qualify for a Civilian Private Pilot's License. To participate in this program, Fourth Year Cadets must be physically and aptitudinally qualified for the Air

Force Flight Instruction Program.

Upon graduation and completion of the Professional Officer Course, selected students for flying or line assignment will be offered commissions as Second Lieutenants in the Air Force Reserve. Reserve Officers who desire lifetime careers in the Regular Air Force may apply for regular appointments after serving on active duty for one year. Cadets who maintain a high academic and aptitudinal average are eligible for designation as Distinguished AFROTC Cadets and later Distinguished AFROTC Graduates. A designee, if fully qualified, may apply for a regular commission upon graduation.

Advanced Placement Program

The colleges have arranged for course placement on the basis of good performance on either the Advanced Placement Examinations of the CEEB or-to a more limited extent-on placement tests given by the colleges during Orientation. The College Board Advanced Placement Exam-

inations are a vehicle to courses on the sophomore level or higher in botany, chemistry, English, French, German, history, Latin, mathematics, physics, Spanish, and zoology, whereas the Duke tests are used to decide such placement only in foreign languages, biological science, and mathematics. A further distinction is that only the AP Examinations may lead to credit toward graduation for the course or courses omitted. The departmental directors of undergraduate study and the University Registrar are charged with the responsibility for evaluations leading to advanced placement of freshman matriculants.

Advanced Placement Examinations are given in May by the College Entrance Examination Board. Information regarding the tests may be obtained from the Board. (For information on credits, see pp. 50-51.)

Study Abroad

A student contemplating study abroad should be guided by the following provisions established by the Undergraduate Faculty Council and administered by the Committee on Study Abroad.

The student should

- 1. have a scholastic average of at least 2.5 (recommended);
- 2. obtain prior permission to study abroad from major adviser and academic dean:
- 3. receive certification from the foreign language department concerned that he can handle adequately the language of the country where he will study, provided that the language be taught at the freshman-sophomore level at Duke;
- 4. obtain, before matriculation, approval of his program of studies from major adviser and academic dean.

If the student wishes to transfer credit to Duke

- 1. and is participating in a program sponsored by an American group, the group must have been approved by the above committee and the program he proposes must meet the qualifications of the sponsoring group
- 2. or studies abroad under his own sponsorship, work to be considered for transfer must be done in the language in which courses are normally given in the institutions attended.

A leave of absence from the University is arranged for students who qualify. When possible, arrangements are made for students to preregister while abroad for the semester in which they return.



Summer Study Abroad

Duke University, in cooperation with the Experiment in International Living, runs a summer program of study abroad in France, Germany, and Spain, open to all qualified Duke students. The program offers the opportunity to earn six to eight hours of academic credit. Participants are selected by the Committee on Study Abroad and the Experiment in International Living. Applications must be submitted to the appropriate academic dean before February 15 to qualify for a summer group.

Intercollegiate Center for Classical Studies

As one of the participating members in the Intercollegiate Center for Classical Studies in Rome, Duke University may nominate majors in

Classical Studies for admission to a semester's work at the Center, usually in the junior year. Instruction is offered in Greek, Latin, Ancient History, and Ancient Art and Archaeology. Students in the program do not withdraw from Duke in the usual sense; grades transfer as earned. Overall 3.0 q.p.r. is required for admission. Some scholarship help is available. Students should consult Professors Richardson, Willis or Stanley for additional information.

Reciprocal Agreement with the Consolidated University of North Carolina

Under a plan of cooperation between the Consolidated University of North Carolina and Duke University, students regularly enrolled in the Consolidated University during the regular academic year, and paying full fees to that institution, may be admitted to a maximum of two approved courses per semester at Duke University upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. Under the same arrangements, students at Duke University may be admitted to approved course work at the Consolidated University of North Carolina.



Resources for Study

Faculty

Numbering over 900, the faculty is large enough to maintain a tradition of personal attention to students, the ratio being one teacher for every seven students. Many members of the faculty are or have been national leaders in their various professional organizations, as well as consultants to industry, government, or foundations, and their contributions to scholarship include innumerable publications in all areas of research. To honor outstanding faculty members, the University has established thirty-two James B. Duke professorships, and there are fourteen other named professorships as well.

University Libraries

To support a rich educational experience in a world of rapid and farreaching change, great library collections are essential. Undergraduate students at Duke are fortunate to have available exceptional resources. The University library, among the first nineteen university libraries in the 70,000 volumes are added annually. Separate departmental and professional school libraries provide notable collections in the several disciplines. A division of photographic services, with the most modern cameras and



other equipment for microfilming or other photographic reproduction of printed and manuscript materials, provides a battery of reading machines to serve the Library's large collection of microfilms of rare books, period-

icals, and newspapers.

The Woman's College library, with its own attractive Georgian building, contains 155,000 volumes in an open stack collection, chiefly those books most frequently used in the undergraduate curricula. The School of Engineering also maintains its own library which contains some 36,000 volumes and 425 periodicals. The larger collections of the main and specialized libraries are at hand when needed.

More detailed information may be obtained in a "Student's Guide to the General Library," available on request to the Librarian of the University.

Laboratories

The laboratories in the various science departments (Botany, Chemistry, Physics, Psychology, and Zoology) are designed for both teaching and research. Instructional and research laboratories are located in the Engineering Building and are available to students of the School. Ideal locations for special work in some of the sciences are available at Duke University Marine Laboratory at Beaufort, North Carolina; at Highlands Biological Laboratory at Highlands, North Carolina; in the Duke Forest at Durham, North Carolina; and in the Sarah P. Duke Gardens on the West Campus of Duke University.

Admission

New students are admitted for the academic year at the opening of school in the fall.

The size of the entering classes is approximately as follows: Trinity College, 675; Woman's College, 390; School of Engineering, 150; the School of Nursing, 80. Since five thousand candidates normally apply and enrollment is limited, the Committee on Admissions selects those students who in its judgment are best qualfied to benefit from the opportunities which the colleges offer. Selection is based not only upon academic grades and test scores but also upon recommendations of school officials and other personal criteria.

Requirements

Although there are no inflexible subject matter requirements, at least fifteen acceptable units of secondary school credit must be presented. Of these at least twelve must be in college preparatory subjects: English, foreign language, history and social studies, mathematics, and physical or biological sciences. Applicants for the School of Engineering are advised to present four units of mathematics and at least one unit in physics or chemistry.

Students applying for admission are required to take the Scholastic Aptitude Test, the English Composition test, and two other achievement tests of their own choosing given by the College Entrance Examination Board. It is recommended that an applicant who has had two or more years of a foreign language in secondary school take the achievement in that language. The foregoing recommendation is not applicable to candi-

dates for the School of Engineering. The Writing Sample is not considered an achievement test and will not be accepted as a substitute for any of the above mentioned tests. Candidates applying to the School of

Engineering must include the appropriate mathematics test.

Prospective students are urged to broaden their reading outside of class during their senior year and to make the acquaintance of books and magazines that do not form part of the subject matter of their courses. At the same time, they should take every opportunity to increase their competence in writing. Those who cannot write simple, clear, grammatical English prose will be progressively at a serious disadvantage in the competition for admission and also in the general work of the freshman year. Careful attention to correctness in English in correspondence and on application blanks cannot be too seriously stressed for candidates for admission.

Regular Admission

Candidates for regular admission must apply no later than January 15, and normally do so during the fall of the senior year. For this group,

decisons are mailed by April 15.

Application forms and instructions regarding procedure and necessary documents to be included will be sent upon request to the Office of Admissions, Duke University, Durham, North Carolina, 27706. A nonrefundable processing fee of \$10.00 must accompany the submission of the full application form.

A candidate for admission who wishes to arrange an interview should

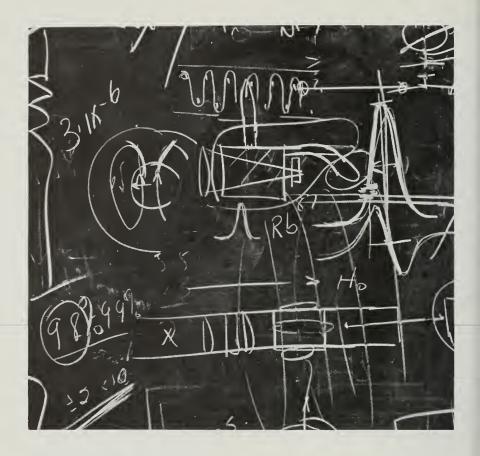
do so through the Director of Undergraduate Admissions.

Early Decision Plan

For the well-qualified student who has definitely decided to enter Duke if accepted, the University offers to reserve a place by "early decision" on December 1 of the student's senior year in secondary school. The deadline date for completing applications for Early Decision is November 1. Interested students should write to the Office of Admissions for detailed information.

Admission to Advanced Standing

Admission by transfer from other institutions may be arranged for a limited number of students under certain well-defined regulations. All such candidates must submit official transcripts of all work completed at other colleges, accompanied by a statement of honorable dismissal and scores on the Scholastic Aptitude Test of the College Entrance Examination Board. An overall grade average of at least C must have been earned on work previously completed; courses on which a grade less than C has been earned cannot be accepted for transfer credit. Students may not



apply for transfer beyond admission to the junior class. Further detailed regulations for admission by transfer may be obtained from the Office of Admissions.

A small number of special students of mature age may be admitted for such courses of instruction as their earlier training and experience may qualify them to take. They may not be accepted, however, as candidates for a degree in a regular course unless they are able to meet all normal requirements for admission which apply to all beginning students.

Readmission of Former Students

A student who desires to return, following withdrawal from college, should apply to the Director of Undergraduate Admissions. He will be asked to send a detailed statement of his activities since withdrawal. If practicable, the student should arrange for an interview with the appropriate Dean of his college.

Financial Information

Fees and Expenses

The prospective student who seeks the optimum opportunity in higher education will not be a bargain hunter. Certainly, some sound plan for paying the cost of college must be devised, but this plan should be formulated after the thoughtful selection of an institution has been made. No college or university can honestly say that an education at the college level is inexpensive. Most university people and the ever growing college alumni families across our nation, however, will reflect the feeling that the benefits derived from a college education constitute a handsome return on the dollars invested.

Each student going to college should analyze carefully his financial situation. In making such analysis it should be recognized that the primary responsibility for defraying the cost of an education lies with the student and his family. The typical college student can depend upon some contribution from his family's current income, a proportionate share of family savings, and anticipated income from summer employment. The number of years of study contemplated and the number of dependent children in the family should be considered in computing the funds which will be available in a particular year.

Fees paid by the students cover only a part of the cost of their instruction and of the operations of the University. Income from endowment and contributions from the alumni, alumnae, and other public-spirited men and women meet the balance, which constitutes more than half the total cost.

Estimated Expenses for an Academic Year

Certain basic expenditures are to be considered in preparing a student's budget, such as tuition, the general fee, room and board. The necessary expenditures together with a reasonable amount allotted for miscellaneous items such as laundry, organizational dues, and sundry purchases are shown as follows:

	Men	Women
Tuition	\$1,450.00	\$1,450.00
General Fee	187.00	187.00
Room Rent	310.00	335.00
Board	* 550.00	†500.00
Books and Supplies	70.00	70.00
Miscellaneous Expenses	‡443.00	‡443.00
Totals	\$3,010.00	\$2,985.00

^{*} Cafeteria estimate. † Board rate. ‡ Moderate estimate.

Miscellaneous expenses beyond the moderate estimate given above depend to a large extent upon the tastes and habits of the individual. It is realistic to suggest that the average Duke student, however, can plan on a budget of \$3,000.00 for the academic year. Travel costs, clothing purchases, and other major expenditures would have to be added to this estimate.

Debts

No records are released and no student is considered by the faculty as a candidate for graduation until he has settled with the Bursar for all indebtedness.

Bills may be sent to parents or guardians provided the Bursar has been requested in writing to do so. Failure to pay bills on or before the due dates will debar the student from class attendance until the account is settled in full.

Tuition and Fees

Tuition and General Fee. The tuition of \$725.00 and the general fee of \$93.50 are due and payable not later than the day of registration for a particular semester. After the day of registration no refund of the tuition or the general fee will be made except for involuntary withdrawal to enter the armed services.

Registration Fees and Deposit. New students, on notification of ac-

ceptance, are required to pay a non-refundable first registration fee of \$20.00 and to make a deposit of \$50.00. The deposit will not be refunded to accepted applicants who fail to matriculate. For those who do matriculate, \$25.00 of the deposit serves as a continuing room deposit for successive semesters, and the remaining \$25.00 serves as a continuing registration deposit. Arrangements for refund of the \$25.00 room deposit are described in information furnished each resident student by the Housing Bureau.

Readmission. Students who have been readmitted to the University after an absence of one or more semesters, on notification of readmission,

are required to make the \$50.00 room and registration deposit.

Late Registration. Students who register in either semester at a date later than that prescribed in the Calendar of the Colleges must pay to the Bursar a fee of \$5.00.

Refunds. The \$25.00 pre-registration deposit will be refunded to students (1) whom the University does not permit to return, (2) who graduate, or (3) who request the refund at the time of pre-registration, thus indicating their intention not to return for the following semester. The pre-registration deposit will not be refunded to students who pre-register and fail to enter the following semester on schedule.

ROTC Deposit. An Air Force ROTC deposit of \$20.00 is required of students enrolling in Air Science to cover possible loss of military equipment issued to them. This deposit is refunded to the student upon return

of issued equipment.

Fees for Special Students. In the regular academic year students who register for no more than two courses with a maximum credit of eight semester hours are classified as special students. They are charged a registration fee of \$5.00 for each course and \$50.00 for each semester hour of course credit. Registration for nine or more semester hours, or three or more courses, requires payment of full fees.

Fees for Auditing. Auditing of one or more courses without charge is allowed students paying full fees, provided that the consent of the instructor is obtained. Students who are enrolled for not less than three nor more than eight semester hours may audit other courses by payment

of \$25.00 for each course audited.

Fees for Duke Employees. In order to encourage its employees in their professional and personal advancement, Duke University will permit fulltime employees who are paid on a monthly basis for two or more years to take one or two courses, but not more than seven semester hours and will charge \$5.00 per course plus \$25.00 per semester hour. Courses may not be audited unless at least one course is taken for credit.

Fees for Transcripts. Requests for transcripts should be directed to the Office of the Registrar. Ten days should be allowed for processing. One transcript is issued free of charge. Additional copies are supplied at \$1.00 each.

Fees for Course Changes. Changes in courses for reasons not arising within the University require a payment of \$1.00 for each change made. No course may be elected later than one week after the opening of the semester, and no student may be admitted to any class without an official enrollment.

Living Expenses

Housing. In the residence houses for undergraduate men, the rental charge for a single room is \$380.00 for the academic year or \$190.00 for each semester; for a double room the charge is \$620.00 for the academic year, or \$310.00 for each occupant, or \$155.00 per semester for each occupant. Rental rates in the air-conditioned dormitories are \$425.00 for a single room for the academic year, or \$212.50 for each semester; for a double room the charge is \$710.00 for the academic year, or \$355.00 for each occupant, or \$177.50 per semester for each occupant. Information concerning the student's obligations under the housing contract is published in the Undergraduate Regulations-for Trinity College and the School of Engineering.

In the residential units of the Woman's College the rental charge for a single room is \$405.00 for the academic year or \$202.50 for each semester. The rental charge for a double room is \$670.00 for the academic year or \$335.00 for each occupant, or \$167.50 per semester for each occupant. Detailed information concerning the student's obligations under the hous-

ing contract is published in the Woman's College Handbook.

Food Services. The dining facilities on the West Campus include three cafeterias, with multiple-choice menus, and the Oak Room where full meals and a la carte items are served. The cost for the academic year ranges from \$550.00 upward depending upon the taste of the individual.

The dining halls in which all resident women have their meals are located in the Woman's College Union and in Gilbert-Addoms residence hall. The charge for board is \$250.00 per semester, payable at the time of registration. If a student withdraws during the first six weeks of the semester, a board refund is made on a pro rata basis; if withdrawal occurs after that time, no refund is allowed.

Student Aid

Duke University is interested in students with ability and ambition. It is the aim of the University Financial Aid Committee and others affiliated with the Financial Aid Program to provide, insofar as possible, the financial assistance required by students accepted for entrance who are unable to defray the cost of college from their own resources. The assistance is made available in the form of scholarships, grants-in-aid, loans,

and part-time employment.

In 1966-67 financial aid totaled \$1,601,000.00. Of this amount \$959,-404.00 was allotted to 1,126 undergraduate students in the form of scholarships, grants-in-aid, and remissions of tuition; \$243,412.00 in student loans, and approximately \$400,000.00 through part-time employment on the campus and in the city of Durham and the surrounding area.

Freshmen students shared proportionately in this aid: 338 received awards totaling \$286,820.00 in direct assistance not including loans or part-time employment. Loans were made to 199 students totaling \$89,100.00 in addition to other assistance received from Duke University.

Scholarships

All requests for applications for scholarships, grants-in-aid, industry scholarships, or remissions of tuition should be addressed to the Office of

Admissions, Duke University, Durham, North Carolina.

All candidates for scholarships and grants-in-aid must submit an official Application for Admission to the University and the Application for Scholarship to the Office of Admissions. Scholarship candidates who desire to be considered for the maximum value of scholarships on the basis of financial circumstances are required to submit the "Parents' Confidential Statement" of the College Scholarship Service. The "Parents' Confidential Statement" may be obtained from high school principals or upon request from the Admissions Office.

Scholarship candidates should initiate their applications during the fall semester of their senior year of study in secondary schools. Instructions concerning the specific requirements and deadline dates will accompany the application materials sent to applicants for scholarships and

grants-in-aid.

Awards annually available to undergraduate students at Duke University fall into eight major categories. These are:

Angier B. Duke Memorial Scholarships. Recipients of these awards are students whose superior records mark them as young men and young women who give outstanding promise of becoming leaders in their chosen fields of endeavor.

Number available: 31 for each freshman class.

Value: To \$2,600.00 annually.

- W. N. Reynolds Memorial Scholarships. Recipients of these awards are students of outstanding ability, superior records, and show the promise of constructive leadership. In considering candidates for the awards, first consideration will be given to:
 - 1. Children of employees of R. J. Reynolds Tobacco Company or any of its affiliates or subsidiaries.

2. Children of families residing in Forsyth County, North Carolina.

3. Other candidates who are residents or natives of North Carolina.

Duke University School of Nursing Scholarships. Recipients of these awards are young women whose superior records indicate outstanding promise of becoming leaders in the profession of Nursing.

Number available: 11 for each freshman class.

Value: \$200.00 to \$1,400.00 annually.

Huguenot Scholarship. A scholarship of \$1,000.00 per year is available from the Huguenot Society of America to a decendant of a Huguenot ancestor.

Christian Vocations Scholarships. Students preparing to enter full-time religious work are eligible to apply for special consideration on the basis of need. These students will be required to submit the "Parents' Confidential Statement." Students with need will be recommended by the Director of Financial Aid to the Christian Vocations Scholarship Committee which will consider the intention of the applicant. Students approved by the Christian Vocations Scholarship Committee are required to sign a note each semester for the amount of financial assistance granted to them by the University Scholarship Committee. These notes will be cancelled upon evidence that the student has entered full time Christian work after graduation. Pre-ministerial and religious education students ranking in the upper quarter of their graduating classes are encouraged to apply for an Angier B. Duke Memorial Scholarship.

Corporation Scholarships. Certain scholarships financed by private corporations are available annually to undergraduate students at Duke University. The selection of the recipients of these awards is made by the University Scholarship Committee. These scholarships are assigned to students whose records of scholarship and leadership are outstanding and

whose financial need can be demonstrated.

Number available: 18.

Value: \$500.00 to \$2,000.00 annually.

Scholarships for Foreign Students. A limited number of awards will be made each year to qualified students from other countries who are accepted by the Office of Admissions as entering freshmen or as students with advanced standing. Candidates for these awards are required to submit the "Application for Scholarship" and the "Parents' Confidential Statement" of the College Scholarship Service provided by Admissions Office of Duke University.

Grants-in-Aid

Recipients of these awards are able students who need financial assistance in order to meet the cost of attending college.

Number available: Approximately 400 annually. Value: From \$100.00 to \$1,500.00 annually.

Remissions of Tuition

Children of ministers in the North Carolina and Western North Carolina Conferences of the Methodist Church who are residents in the Conference and children of ministers of all faiths residing in Durham County are eligible to receive a remission of the tuition charge for a maximum of eight semesters of undergraduate study at Duke University.

Tuition Grants

Tuition grants are available to children of certain qualified staff members of Duke University for a maximum of eight semesters of undergraduate study at Duke University.

Loans

Loan funds held in trust by the University as well as funds supplied by the federal government through the National Defense Education Act of 1958 are available to qualified students. Freshmen as well as upperclassmen are eligible to apply for a student loan.

Loans generally mature after borrowers have left the University. Loan interest on long term loans from University funds accrues at the rate of one per cent from the date of each note. After a student has left the University permanently, the loans begin bearing interest at the rate of three per cent per annum. The balance unpaid after five years bears

interest at the rate of six per cent per annum.

In addition to local loan funds, Duke University participates in the student loan program established under the provisions of the National Defense Education Act of 1958. Repayment of loan funds under the National Defense Education Act of 1958 normally begins nine months after the student terminates his education at the University, with complete repayment scheduled within a ten-year period. Interest accrues at the rate of three per cent commencing nine months after the borrower ceases to be a full-time student at an institution of higher education. Special benefits to those teaching in public or private nonprofit elementary and secondary schools and in institutions of higher education permit a portion of the loan to be cancelled depending upon the length of teaching service. Complete details regarding the student loan program may be obtained by writing directly to the Student Loan Office.

The Student Loan Committee in approving loan applications selects those students who from the standpoint of character, scholastic attainment, personality, and degree of financial need are deserving of this consideration. A student in residence may not, without special permission, own or operate a car during the academic year for which the loan is granted. Loan applications must be submitted not later than July 1,

preceding the academic year for which assistance is requested.



Employment Opportunities

The Financial Aid Office maintains an employment office to serve students who need part-time jobs. There are many opportunities both on the campus and in the city of Durham. A considerable number of students each year help defray their college expenses by working.

Those students accepted for admission to Trinity College and the School of Engineering in need of part-time employment should apply to Financial Aid Office, Duke University, Durham, North Carolina. Students in the Woman's College should apply to the Assistant Dean of Undergraduate Women, 108 East Duke Building, Duke University, Durham, North Carolina.

Prizes and Awards

The achievements of undergraduate students are recognized in various fields of college activity. The following prizes suggest the range of the recognition:

The Debate Council. This council authorizes the awarding of medals to members of the graduating class who have represented the University in at least two intercollegiate debates. The medals are given by the local

chapter of the Tau Kappa Alpha Fraternity.

The Robert E. Lee Prize. The gift of the late Reverend A. W. Plyler, of the class of 1892, and Mrs. Plyler. The sum of \$50 is awarded annually at Commencement, preferably to that member of the senior class of Trinity College or the College of Engineering who, in character and conduct, in scholarship and athletic achievement, in manly virtues and capacity for leadership, has most nearly realized the standards of the ideal student.

Alpha Kappa Psi Medallion. Beta Eta Chapter of Alpha Kappa Psi, a professional fraternity in commerce, awards annually the Alpha Kappa Psi Scholarship Key to the male senior student pursuing a degree in the Department of Economics and Business Administration who has attained the highest scholastic average for three years of collegiate work in this

University.

Medal of the North Carolina Association of Certified Public Accountants. The North Carolina Association of Certified Public Accountants annually awards a medal to the senior who, in the judgment of his instructors, is the most outstanding student in accounting in his grad-

uating class.

Julia Dale Prize in Mathematics. This is a prize of books given annually to the undergraduate who shows the greatest proficiency in the

study of calculus.

The Henry Schuman Music Prize. This prize of \$100 is awarded annually to an undergraduate of Duke University for an original composition of chamber music or a distinguished paper in music history or analysis. The award is sponsored by The Woman's College and the Department of Music of Duke University through a continuing gift from Dr. and Mrs. James H. Semans who named the prize after Mr. Henry Schuman, a life-long friend of the Semans and Trent families, a talented

amateur violinist, and one who helped to build valued collections in the

Duke Library.

The Milmow Prize. This prize consists of a certificate of award and a one year's payment of dues in the Institute of Electrical and Electronics Engineers for the membership year in which the honoree is awarded his baccalaureate degree. It is awarded annually to that student from North or South Carolina graduating in the Department of Electrical Engineering who in the opinion of the faculty of that department and as shown by his grades has made the most progress in electrical engineering during his last year in college.

The George Sherrerd III Memorial Award in Electrical Engineering. This award was established in 1958 by the parents of George Sherrerd III, a graduate of the class of 1955, to recognize outstanding undergraduate scholarship. The award, consisting of the income from a fund of \$5000.00, is made annually to that senior student in Electrical Engineering who in the opinion of the Electrical Engineering faculty has attained the highest level of scholastic achievement in all subjects and simultaneously has rendered significant service to the School of Engineering and the University at large. The recipient's name is inscribed on a plaque displayed in the Engineering Building.

The Charles Ernest Seager Memorial Award. This award, established in 1958 by the widow and friends of Charles Ernest Seager, a graduate of the class of 1955, recognizes outstanding achievement in the annual Student Prize Paper Contest of the Duke Branch of the Institute of Electrical and Electronics Engineers. The award consists of inscribing the name of the contest winner on a plaque displayed in the Engineering Building.

The American Society of Civil Engineers Prize. This prize consists of a certificate of award and a one year's payment of dues in the American Society of Civil Engineers. Awards are made annually by the North Carolina Chapter to the two outstanding seniors in civil engineering based on the recommendation of the faculty of the Civil Engineering Department. The basis for selection is the student's scholastic record, his contribution to the student chapter, and his participation in other college activities and organizations.

The Tau Beta Pi Prize. The North Carolina Gamma chapter of Tau Beta Pi, national engineering honor society, awards each year a suitable prize such as an engineering handbook to a sophomore student in engineering for outstanding scholastic achievement during the freshman year.

The Phi Lambda Upsilon Prize. Phi Lambda Upsilon, honorary chemical society, yearly awards a suitable prize to an outstanding junior who is majoring in chemistry. The recipent's name is inscribed on a plaque displayed in the Chemistry Library.

The Pegram Chemistry Club Prize. This prize is awarded in the spring of each year for scholarship in chemistry, physics, and mathematics. The prize consists of a one-year junior membership in the American Chemical

Society and a one-year subscription to either the Journal of the American Chemical Society or Industrial and Engineering Chemistry. To qualify for this prize, the student must (1) be enrolled as an undergraduate of Duke University and (2) be taking or have taken a fourth-year chemistry course. The winner of this prize is selected by a committee consisting of at least one faculty member and at least two members of the Pegram Chemistry Club; the selection is based on the quality-point average for all courses taken in chemistry, physics, and mathematics. In case of a tie equal awards are given.

The James B. Rast Memorial Award in Comparative Anatomy. This award is given annually by the parents of James Brailsford Rast in memory of their son, a member of the class of 1958 at Duke University. The award, consisting of the Atlas of Descriptive Human Anatomy by Sobotta and bearing the James B. Rast Memorial bookplate, is given to the student who demonstrates the greatest achievement in the study of

comparative anatomy.

The Anne Flexner Memorial Award in Creative Writing. This award has been established by the family and friends of Anne Flexner, who graduated from Duke in 1945. It consists of fifty dollars in cash and a number of books chosen by the student. The award is given annually for the best piece of creative writing submitted by a Duke undergraduate. The competition is limited to short stories (5,000 word limit), one-act plays (5,000 word limit), poems (100 line limit), and informal essays (3,000 word limit). Only one manuscript may be submitted by a candidate, and it must be delivered to the English Office, Room 325 Allen Building, before April 15.

The William Senhauser Prize. This prize is given by the mother of Willam Senhauser in memory of her son, a member of the Class of 1942, who lost his life in the Pacific Theatre of War on August 4, 1944. The award is made annually to the sophomore or junior in Trinity College or the School of Engineering who has made the greatest contribution through participation and leadership in intramural sports. The winner of this prize is chosen by a committee selected by the President of the Uni-

versity.

The Friends of Duke University Library. This group offers three prizes in an annual contest open to all undergraduate students for the best book collections acquired during their college year. The contest is supervised by the Undergraduate Committee of the Friends of the Library, which announces each fall the terms of the award. Inquiries may be directed to the Curator of Rare Books. Collections entered in the contest are exhibited each spring in the General Library. The prizes are awarded on the basis of the student's collection, a personal interview to determine the overall planning and objectives of his collecting activity, and his familiarity with his own books and the general field of his collecting interest.

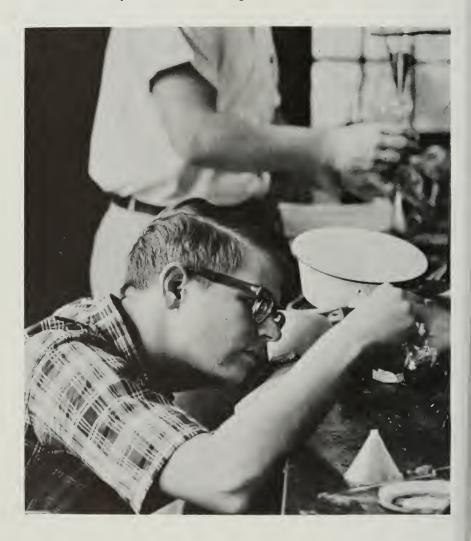
The William T. Laprade Prize in History. This prize, in honor of Wil-

liam T. Laprade, who was a member of the History Department at Trinity College and Duke University from 1909 to 1953, and Chairman of the Department from 1938 to 1952. This prize is awarded to that senior who is graduating with distinction and whose senior essay in history has been judged unusually meritorious.

The Donald E. Spofford Medal. This medal is presented to the most

outstanding member of the Men's Student Government Association.

The Horace F. Inman Award. This award is made to the fraternity, freshman, and independent dormitory which throughout the year demonstrates the best qualities in citizenship.



University Registrations and Regulations

Registrations

Pre-registration

Each new student receives a copy of the Academic Guide for Freshmen and the Bulletin of Undergraduate Instruction in the summer and submits a trial course program for his first semester. All other students preregister for a given semester in the fall or spring of the year on the basis of information and advising available to them. Evidence that the continuing pre-registration deposit of twenty-five dollars has been paid (See pages 37-38 for detailed information) must be submitted at the time of spring pre-registration. A student's tentative course program is filed for permanent record in the Central Records Office after each pre-registration. He may complete his registration by mail. Students who preregister in either semester at a date later than that specified in the calendar of the colleges are subject to a penalty of \$5.00, payable to the Treasurer. Students who do not pre-register within an allotted time must be readmitted to the college by application to the Director of Admissions.

Semester Opening and Registration

Each pre-registered undergraduate student is required to return to the University each semester on registration day and to report to his college office by 6 p.m. Ample time should be allowed since failure to report entails loss of the continuing registration deposit and of registration in each class for which one is pre-registered. An official enrollment is required for admission to any class.

After pre-registration course changes may be made on registration day or during the first week of classes. Changes in courses for reasons not

arising within the University entail a fee of \$1.00.

Academic Regulations

Course Requirements

During each semester of the regular academic year, the academic program of an undergraduate student normally consists of four or five courses totaling fourteen to seventeen semester hours (Trinity and the Woman's College), or fifteen to seventeen semester hours (School of Engineering), in either case exclusive of physical education. A maximum program of nineteen semester hours exclusive of physical education has also been fixed since the University is committed to quality work and education that is not exclusively course centered. No student is allowed to take fewer than fourteen semester hours of work without special permission from the appropriate dean or to take more than the normal load of work unless his average grade in the preceding semester is higher than a C.

Prior to pre-registration in the second semester of his sophomore year, each student is required to choose his major field and confer with his departmental adviser about the requirements for major and related work.

Special permission of the Director of Undergraduate Studies in the student's major department and the approval of his dean are required for a senior to elect for credit toward graduation any course open primarily to freshmen. Juniors require similar approval to take more than one such course.

Course Audit

With the consent of the instructor, a full-time, degree student is allowed to audit one or more courses in addition to the normal program. After the first week of classes in any semester, no student classified as an auditor in a particular course may take the course for credit, and no student taking a particular course for credit may change classification to an auditor. A student may not repeat for credit any course he has previously audited. Auditors submit no daily work, take no examinations, and receive no credit for courses.

Course Changes

New courses may not be elected later than one week after the opening of classes during the semester. Procedures for withdrawal from a course are determined by each of the undergraduate colleges, but in any instance permission of the Dean is required.

Attendance Regulations

The attendance regulations specifically place the responsibility for class attendance upon the individual student. He is expected to attend classes regularly and punctually. A student should recognize that one of the most vital aspects of a residential college experience is attendance in the classroom and that the value of this academic experience cannot be fully

measured by testing procedures alone.

The members of the student body are considered sufficiently mature to appreciate the necessity of regular attendance, to accept this personal responsibility, and to demonstrate the kind of self-discipline essential for such performance and, conversely, to recognize and accept the consequences of failure to attend. An instructor is privileged to refer to the Dean of the appropriate college for suitable action students who in his opinion are causing their work or that of the class to suffer because of absences or latenesses.

Absences from tests and required classes due to illness will be excused when certified by a proper medical official. Absences due to authorized representation of the University may be excused. Officials in charge of groups representing the University are required to submit names of those persons to be excused to the appropriate Dean's office forty-eight hours in advance of the hour when their absences are to commence.

Regulations for Participation in Athletics and Other Activities

Members of athletic teams or other student groups engaging in public representation of the University are expected to be carrying their current work satisfactorily. Students may be barred from participation in such representation if, in the opinion of the Dean of their college, they fail to meet this requirement.

Grading

Final grades on performance in academic work are sent to students and parents, or guardians, after the examinations at the end of each semester. In addition six-weeks advisory grade reports for freshmen are mailed each semester. Grade symbols are:

Passing. Passing grades are A, exceptional; B, superior; C, average; and D, low pass. A passing grade may be modified by a plus (+) or a minus (-).

Failing. A grade of F indicates that the student has failed the course and that in order to receive credit for the course he must repeat the work

in class.

Pass-Fail Option for Elective Courses. With the consent of the instructor, a third or fourth year student may choose to be graded on a pass-fail basis in one free elective course each semester. A student accepted on this basis completes all the work of the course but receives either a pass (P) or fail (U) grade in lieu of a standard grade. The credit hours earned apply only in the total cumulative average (see p. 52), as do transfer and Advanced Placement credits. For that reason they are weighted as "C's" toward the required senior "C" average. A pass grade may not subsequently be converted to a regular letter grade nor may the course be retaken on a regular credit basis.

Absence from the final examination. In all cases in which the student is absent from a final examination, he receives an X instead of a final grade. If he does not present an acceptable explanation for his absence to the appropriate Dean's office within forty-eight hours after the scheduled time for the examination, the X is converted to an F. A student absent from examination, if the absence has been excused by the Dean, may receive an examination upon payment of a fee of \$5.00 to the Treasurer of the University. The instructor concerned arranges for examination in cases where absences are excused. An X not cleared by the end of the semester following the examination missed is converted to an F.

Incomplete work. If because of illness or other emergency a student's work in a course is incomplete, he may receive an I for the course instead of a final grade. Incomplete courses must be completed before the close of the succeeding semester; otherwise, the I is converted to an F and the course must be retaken if the student is to receive credit for it. In case a student whose work is incomplete is also absent from the final examina-

tion, he receives an X for the course.

Withdrawal. The letter W is used to indicate official withdrawal from a course. If a student drops a course without the permission of his dean, a grade of F is recorded. If he drops with permission a course in which he is failing, the grade for that course is recorded as an F unless in the judgment of the Dean circumstances do not require this penalty but permit a notation of a W to indicate official withdrawal.

Credits

The unit of credit used is the semester hour, which signifies one class period a week throughout the semester. Two or three hours of laboratory work are equivalent to one hour of class work.

Seniors who at the beginning of a semester lack no more than nine hours for the fulfillment of the requirements for the A.B. or B.S. degree may enroll, with permission of the Dean of the Graduate School, in graduate courses for a maximum total program of fifteen semester hours.

Advanced Placement Course Credit

Any student who has earned a score of three or higher on an Advanced Placement examination of the CEEB and is approved for placement in a sophomore-level course or above may be considered for course credit in appropriate subjects. (See p. 26). For those presenting scores of four or five the award of credit will be made automatically upon matriculation; for those presenting scores of three it will be determined with the approval of the University department concerned no earlier than at the end of the first semester. Course credit may be granted for one or two semesters in each subject area in which examination is offered in the Advanced Placement Program.

Transfer Credit

Transfer credit is evaluated from regionally accredited, degree-granting institutions. Courses taken away from Duke in which grades of less than C have been earned are not acceptable for transfer credit. Credit for work completed at other institutions will be determined in relation to the curriculum requirements of the college in which the student enrolls at Duke.

Credit for courses in science or language offered for advanced standing in any of the undergraduate colleges by a transfer student from a junior college will be evaluated by the departments concerned.

The maximum amount of credit acceptable from a junior college is sixty semester hours, exclusive of physical education. No credit is given for work completed by correspondence, and credit for no more than six semester hours is allowed for extension courses

Residence Requirements

Ordinarily, the final four semesters-or equivalent-of work must be earned at Duke except in those instances in which a student has been approved to take his junior year abroad. (For engineering students, thirty of these sixty semester hours must be from those normally taken in the senior year.) Students who meet this requirement but who still lack six to eight semester hours in final fulfillment of requirements may take this work in another institution of approved standing, provided the course is approved by the Chairman of their major department and by the Dean.

In the case of women six or more years out of The Woman's College, up to 30 hours of work may be taken in another institution of approved

standing in final fulfillment of requirements providing that (1) she was in good standing when she withdrew from Duke; (2) she proposes in advance a plan which ensures that the work to be taken elsewhere will be comparable to the work required at Duke; (3) she demonstrates that a return to Duke to complete the work for the degree would be either impossible or occasion serious hardship; and (4) she is prepared to take Duke examinations on any courses taken elsewhere if required by the department concerned.

Quality Points and Class Standing

An overall indication of the quality of student performance is provided by assigning quality points per semester hours of a course as follows:

Grade	Quality Points	Grade	Quality Points
A+	4.0	C+	2.3
A	4.0	C	2.0
A-	3.7	C—	1.7
B+	3.3	D+	1.3
В	3.0	D	1.0
В—	2.7	D—	1.0
		F	0

On the basis of these points two averages are maintained for students, one a Duke cumulative average (determined by dividing the number of quality points earned at Duke by the total number of hours carried at Duke—not semester hours passed), the other a total cumulative average. The latter also includes credit assigned to work transferred from other institutions, credit assigned to the successful completion of elective courses under the pass-fail option, and that given in recognition of successful advanced placement (see p. 51). In order to carry forward such credit, two quality points are assigned per semester hour. No grade is entered on a student's permanent record in the case of transfer credit or APP credit. All honors at Duke are determined on the basis of the Duke cumulative average; however, the total cumulative average is the basis for determining whether continuation and graduation requirements have been met.

Trinity College and the Woman's College

In Trinity College or the Woman's College a student must achieve at least the following credits and q.p.r.'s for continuation from

The first to the second year	18 s.h. credit and a q.p.r. of 1.30
The second to the third year	42 s.h. credit and a q.p.r. of 1.60

The third to the fourth year 66 s.h. credit and a q.p.r. of 1.70 The fourth to the fifth year (if needed) 90 s.h. credit and a q.p.r. of 1.80

While the meeting of these requirements does not guarantee continuance in College, it represents the absolute minimum in the absence of which no student will be permitted to remain.

Freshmen must also pass at least six semester hours of work in their first semester, nine semester hours in the second semester, and eighteen semester hours in their first year; all other students must pass at least nine semester hours each semester. Physical education credits are excluded in each case.

Senior Class Privileges. Students who have completed 90 or more semester hours of work and have attained a quality point ratio of at least 1.80 are eligible for privileges normally accorded seniors.

Requirements for Graduation. In addition to a completion of an approved curriculum a student must meet at least the following minimum requirements: 124 semester hours with 248 quality points and a q.p.r. of 1.90. The work of the senior year must also average at least a C (2.00).

School of Engineering

A student in the School of Engineering matriculating after September 1, 1965, must achieve at least the following for continuation from

The first to the second year 18 s.h. credit and a q.p.r. of 1.30 The second to the third year 46 s.h. credit and a q.p.r. of 1.60 The third to the fourth year 74 s.h. credit.and a q.p.r. of 1.70 The fourth to the fifth year (if needed) 102 s.h. credit and a q.p.r. of 1.80

Freshmen must also pass at least six semester hours of work in their first semester, three required courses in the second semester, and eighteen semester hours in the first year; all other students must pass at least nine semester hours each semester. Physical education credits are excluded in each case.

Senior Class Privileges. Students who have completed 96 or more semester hours of work including certain specially designated junior courses are eligible for privileges normally accorded seniors.

Requirements for Graduation. For graduation from the School of Engineering in addition to completion of an approved curriculum, a student matriculating after September 1, 1965, must meet at least the following minimum requirements: the completion of 134 semester hours; an accumulative q.p.r. of 1.90; and a q.p.r. of 2.0 in all work, as well as in all Engineering work, taken after having attained senior standing.

Commencement

Degrees are awarded in June at commencement to those who have completed requirements at the end of either regular semester of the academic year. They are awarded at the end of the summer to students who complete degree requirements in a summer session.

Eligibility for Academic Honors

Dean's List. In recognition of academic achievement, students who earn an average quality point ratio of 3.0 or higher on a semester's work of not less than the minimum academic load are placed on the Dean's List.

Class Scholars. The five students in each combined undergraduate class of the University (including Trinity College, the Woman's College, and the School of Engineering) who achieve the highest quality point ratio on at least a normal course load for each academic year shall be designated Class Scholars.

Class Honors. To be eligible for Class Honors a student must earn, during the year, credit for at least the minimum academic load permitted by the college in which he is registered. Students in the freshman, sophomore, and junior classes who earn a 3.50 quality point ratio on all

work for the year are eligible for Class Honors.

Graduation Honors. To be eligible for consideration for Graduation Honors a student must have completed in residence a minimum of ninety semester hours. Students who earn an average of at least a quality point ratio of 3.50 are recommended for a degree magna cum laude. Those who earn a quality point ratio of 3.75 are recommended for a degree summa cum laude.

Eligibility for Special Curricular Programs

Special Courses, Special Sections, and Tutorials for Entering Freshmen. Special introductory courses and special sections of introductory courses are offered to qualified entering freshmen. One-credit-hour tutorials are available to accompany regular introductory courses. Special sections are designated by the letter X; special courses, by the numbers 41, 42; tutorials, by 43, 44. In general, special sections presume background and competence in the given area of study. Tutorials, on the other hand, presume special interest and desire for additional involvement in an intellectual activity, but no special background or competence.

Reading-out of Introductory Courses. The option to "read" in order to by-pass introductory or pre-requisite courses is open to students of demonstrated academic ability to allow them to advance at their own pace to upper-level work. This opportunity ensures a richer program for the student who has few places in his curriculum for electives. Any student interested in reading during the summer to by-pass an introductory or pre-requisite course must be recommended by his dean and secure the permission of the department concerned. Reading for a course and auditing are mutually exclusive procedures. A proposed program of reading should be approved by the director of undergraduate studies in the department in which the work will be done. On passing a three-hour qualifying examination prepared by the department a student may be certified for advanced course work in the area. On completion of an advanced course, an entry will be made on his permanent record that he has passed a qualifying examination but no course credit is awarded. Interested students should request further information from their respective Dean's Offices.

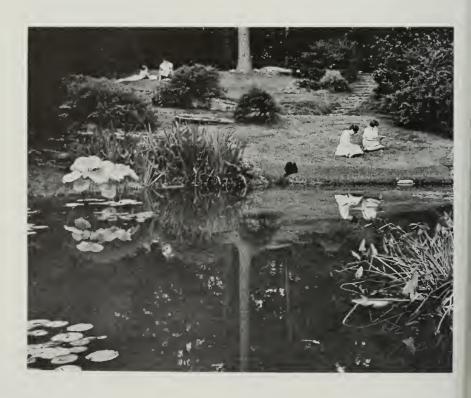
Independent Study. Students who have a 3.0 quality point ratio overall and in their major may be permitted to enroll for independent study during their junior and senior years. The courses, numbered 191, 192 and 193, 194, are designed to permit students to pursue individual research and reading in a field of special interest subject to the supervision of a member of the staff. A student need not be in a Graduation with Distinction program to enroll in independent study courses. The maximum credit allowed for independent study and honors research courses is three semester hours per semester during the junior year and six semester hours per semester during the senior year. Interested students should consult the Director of Undergraduate Studies in the department in which they wish to work.

Graduation with Distinction. Programs featuring independent study and other honors opportunities are available under the title Graduation with Distinction in the majority of the academic departments. Although the details and requirements of the program vary from department to department, certain general requirements are uniform. Each department participating invites, at the end of their junior year, those students who have maintained at least a "B" average in the major field and an over-all average of "B" to enter the Graduation with Distinction Program. After participation in a senior seminar, and/or a directed course of reading, laboratory research, or other independent study, the student must embody the results of his individual research and study in a distinguished piece of writing. The paper is assessed by a departmental committee which, if it approves, recommends that the student be Graduated with Distinction in his major field. Interested students should consult the Director of Undergraduate Studies in the appropriate department.

Honors-Masters Program. This program, which is made possible partly by a grant from the Ford Foundation's Fund for the Advancement of Education, aims at the recruitment and accelerated preparation of college and university teachers. Academically superior undergraduates are selected by the Honors-Masters Committee during the spring of their sophomore year. During the junior year, these pregraduates are enrolled in Colloquium 101, 102; normally the pregraduates will be candidates for graduation with distinction in their major departments. Emphasis is also placed on the acquisition of reading knowledge of two satisfactory foreign languages prior to the beginning of graduate work. Summer school scholarships as well as a limited number of first-year graduate scholarships are available.

Distinguished Professor Seminars. Interdisciplinary one-semester seminars of restricted enrollment offered to upperclassmen will be led by senior members of the faculty, usually holders of named chairs. Professors and topics are announced under the title University Courses. (See page 178.) Because of their scope, the seminars lie outside any particular major though a department may, at its discretion, accept one or more of them as related work. Each carries three semester hours credit.

Juniors and seniors with overall averages of at least 2.75 who meet prerequisites listed for particular seminars may apply for a seminar through the Dean of their College. Preference is given to juniors and to those not enrolled in a senior honors seminar. The selection of seminar groups is made by the moderators.



The Summer Session

The summer session at Duke University makes available to Duke undergraduate students and to undergraduates from other universities and colleges a notable program of instruction in many fields of knowledge, both academic and professional.

Undergraduates in Duke University who desire to accelerate their programs may complete the work for a degree in three years by attending

two or more summer sessions.

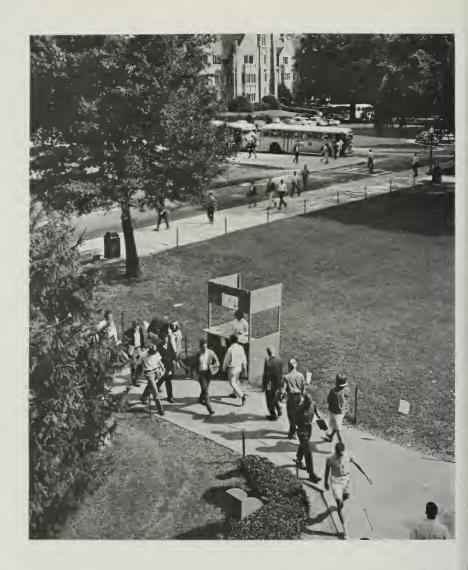
Undergraduates from other colleges and universities may enjoy the special advantages of summer instruction at Duke and transfer their earned credits to their own institutions.

The Summer Session of 1967 will include two terms: Term I, June 12 to July 18; Term II, July 20 to August 25. By attending both terms it is possible for a student to earn as many as twelve semester hours of credit.

Instruction of interest to undergraduates will be offered in the summer of 1966 in the following departments and colleges: Botany; Chemistry; Economics and Business Administration; Education; Nursing; Engineering; English; Forestry; French; Geology; German; Greek; Health and Physical Education; History; Latin and Roman Studies; Mathematics; Philosophy; Physics; Political Science, Psychology; Religion; Slavic Languages and Literatures; Sociology; Spanish; and Zoology.

Distinctive features of Summer Session instruction are provided by the program in marine biology offered at the Duke Marine Laboratory, Beaufort, North Carolina, and by various conferences in several of the depart-

ments.



While the basic purpose of the Summer Session is to serve the academic and the professional requirements of those who are interested in their own educational advancement, the University recognizes the need of, and provides for, a varied recreation program, both athletic and social.

Undergraduates of Duke University, both men and women, who plan to attend the Summer Session should enroll with the Dean of their own college in Duke University. Undergraduates in other universities or colleges who seek transfer credits should apply directly to the Director of the Summer Session, Duke University, Durham, North Carolina.

Courses of Instruction

Note. Courses primarily for freshmen are numbered from 1 to 49; those primarily for sophomores are numbered from 50 to 99; those primarily for juniors and seniors from 100 to 199; those primarily for seniors and graduates from 200 to 299. The amount of credit for each course is given in semester hours following the description of the course.

The designation of (w) or (E) indicates that the course is to be given on the West Campus or on the East Campus. Odd-numbered courses are usually offered in the fall semester; even-numbered courses in the spring semester. For courses which will be offered in 1967-68, consult the Official Schedule of Courses available to enrolled students in the Registrar's Office.

Double numbers separated by a hyphen indicate that the course is a year-course and must normally be continued throughout the year if credit is received. A student must secure written permission from the instructor in order to receive credit for either semester of a year-course. Double numbers separated by a comma indicate that although the course is a year course, credit may be received for either semester without special

permission.

Air Force Aerospace Studies

Professor Schlögl, Lt. Colonel, USAF, Chairman; Associate Professor Stanley, Lt. Colonel, USAF, Director of Undergraduate Studies, Assistant Professor Thompson, Major, USAF, Commandant of Cadets

Eligibility Requirements. Freshmen enrolled in Trinity College and the School of Engineering are eligible to enroll in the General Military Course in the Air Force ROTC. For enrollment in the Professional Officer Course the student must have successfully completed either the General Military Course or the six weeks Field Training Course; must execute a written agreement with the government to complete the Professional Officer Course; must be sworn into the Enlisted Reserve; and he must agree to accept a commission in the United States Air Force Reserve upon graduation.

Deposit Required. Each student must make a deposit of twenty dollars with the University Treasurer to insure return of all Government Property.

Course of Study. The course of study of AFROTC is composed of courses in the Department of Air Force Aerospace Studies. In addition to classroom instruction, the Air Force requires Leadership Laboratory each semester.

General Military Courses

First Year

AS 1. Leadership Laboratory.

AS 2. Defense of the United States. A study of the causes of world conflict, the problem of United States security, and the role of the armed forces as instruments of national policy. 2 s.h. (w) Thompson

Second Year

AS 51. World Military Systems. A comparative study of free world military forces, Communist Military Systems, and trends in the development and employment of military powers. 2 s.h. (w) Thompson AS 52. Leadership Laboratoru.

Professional Officer Courses

All students selected to continue Aerospace Studies pursue:

First Year

AS 101, 102. Growth and Development of Aerospace Power. A study of development of aerospace power in the United States; mission and organization of the Defense Department; Air Force concepts, doctrine and employment; astronautics and space operations; future development of aerospace power. Leadership Laboratory is required. 6 s.h. (w) Stanley

Second Year

AS 203. The Problems of Flight and the Aerospace Sciences of Weather and Navigation. For pilot and navigator cadets, elective for all others. 2

s.h. (w) Schlögl

AS 205, 206. The Professional Officer. Studies of the principles of leadership and their professional application in combat and managerial situations. Final portion of the second semester is devoted to the Military Justice system. Leadership Laboratory is required. 6 s.h. (w) Schlögl

Art

Professor Heckscher, Chairman; Associate Professor Jenkins, Director of Undergraduate Studies; Adjunct Professor Bier; Professors Hall, Markman, and Patrick, Associate Professors Sunderland and Mueller, Visiting Instructor Hannegan; Messrs. Stars and Pratt

Aesthetics

121. The Principles of Art Criticism. The development of criteria for making sound critical judgments based on analyses of painting, sculpture, architecture, and design. 3 s.h. (E) Patrick

221-222. History of Aesthetics. Theories of art and beauty in the western world from antiquity to the present. Some attention will be given the development of theories of aesthetics in the Far East. 6 s.h. (E)

History of Art

51-52. Introduction to Art History. The development of architecture, sculpture, painting, and the minor arts as material manifestations of the culture of the western world from ancient to modern times, with some reference to primitive, Oriental, and other non-western culture; the visual arts as a record of a whole civilization. 6 s.h. (E & W) Staff

131. Art and Archaeology of the Hellenic World. Preliminary treatment of archaeological material from the Aegean, the geometric and orientalizing periods, followed by the architecture, sculpture and vase paintings of ancient Greece from archaic through Hellenistic times. Not open for credit to students who have taken Classical Studies 141. 3 s.h. Markman

132. Roman Art and Archaeology. The archaeological background for the formation of the Roman style as derived from Etruscan, Greek, and indigenous Italian sources, followed by the architecture, sculpture and painting from the early republic to the end of the empire in Italy, and in the provinces. Not open for credit to students who have taken Classical Studies 142. 3 s.h. (w) Markman

133. Mediaeval Architecture. A survey of Christian architecture in the Near East, the Balkans, Russia, and western Europe from the beginnings of the mediaeval style in the late classical period to its disintegration in the fifteenth century. 3 s.h. (E) Sunderland

134. Mediaeval Painting and Sculpture. A study of painting, including mosaics, manuscripts, stained glass, and sculpture, in western Europe from the late classical period through the fourteenth century. 3 s.h. (E)

Sunderland

135, 136. Art of Northern Europe in the Fifteenth & Sixteenth Centuries. Netherlandish painting from the van Eycks to Bruegel with references to French fifteenth century illumination and painting the first semester; German painting from Witz to Duerer, Gruenewald, and Holbein, with additional attention to graphic art and sculpture in the second semester. 6 s.h. (E) Mueller

137, 138. Italian Renaissance Art. A consideration of Italian sculpture and painting in the fifteenth and sixteenth centuries. The first semester will be devoted to the art of the fifteenth century; the second to that of the

sixteenth. 6 s.h. (E) Jenkins

140. Seventeenth Century Painting and Sculpture in Europe. This course traces the evolution of the Baroque style in European painting and sculpture with some attention being given to related manifestations in the late sixteenth and early eighteenth centuries. Particular emphasis is laid on developments in Flanders, France, Holland, and Spain. 3 s.h. (E) lenkins

141. American Art. A survey of architecture, sculpture, and painting in America from the time of the first settlers to the present day, including a consideration of the contributions of the English, Dutch, French, and Spanish to the artistic heritage of the United States. 3 s.h. (E) Patrick

143. The History of Prints and Drawings. An historical and critical study of drawings and prints from the fifteenth century to the present with reference to functions, values, and relationships to other forms such

as painting, sculpture, and the book. 3 s.h. (E) Mueller

144. Renaissance and Baroque Architecture. A study of the development of Renaissance architecture in Italy from its beginnings in the fifteenth century in the works of Brunelleschi to its flowering in the seventeenth century Baroque works of Bernini and Borromini, along with a consideration of the spread of Italian Renaissance forms to north Europe in the sixteenth century and its development into a Baroque style in the seventeenth century. 3 s.h. (E) Sunderland

145-146. The Rise of Contemporary Architecture. A study of the sources and evolution of the architecture of today, from the eighteenth-century conflict between Romantic Historicism and Industrialism to the work of Gropius, LeCorbusier, Wright, and their successors. 6 s.h. (E)

Hall

Seniors graduating at midyear may receive credit for 145, which is

otherwise prerequisite to 146.

147. Painting and Sculpture in the Eighteenth and Nineteenth Centuries. An investigation of the development of painting from the final stages of the Baroque in the eighteenth century to the period of the impressionist movement in the last decades of the nineteenth century. 3 s.h.

(E) Hannegan, Sunderland

148. Modern Painting and Sculpture. The history of European painting and sculpture from 1863 to the present day. The course investigates the rise of the anti-academic movements of Impressionism and Post-Impressionism in the latter half of the nineteenth century; their outgrowth in Cubism, Expressionism, and Surrealism; and the various abstract styles of the twentieth century. Particular emphasis is placed on such artists as Manet, Renoir, Cezanne, van Gogh, Gauguin, Seurat, Matisse, Picasso, Braque, and Klee. 3 s.h. (E) Patrick

191, 192. Independent Study. Directed reading and research. Open only to qualified students in the junior year, by permission of the Depart-

ment. (See page 55). 6 s.h.

193, 194. Independent Study. Directed reading and research. Open only to qualified students in the senior year, by permission of the Department. 6 s.h.

For Seniors and Graduates

217. Aegean Art. A study of the problems of Aegean art as the forerunner of Greek art and in relation to the contemporary civilization of the eastern Mediterranean world. 3 s.h. (w) Markman

218. Early Greek Art. A study of the problems of the origin and development of Greek art in the Geometric period to the end of the Archaic.

3 s.h. (w) Markman

233. Early Mediaeval Architecture. The development of religious architecture from the time of Constantine to the end of the First Romanesque style in the third quarter of the eleventh century. 3 s.h. (E) Sunderland

234. Romanesque Sculpture. The development of sculpture in western Europe from the early Christian period through the culmination of Romanesque art in the west portal of Chartres Cathedral. 3 s.h. (E) Sunderland

239. Architecture of Britain. After a summary of recent archaeological activity in the British Isles, and a survey of Mediaeval building, the course deals principally with changing architectural problems and their solutions from the advent of the Renaissance onward. Attention is given to the interests of students majoring in history or literature. 3 s.h. (E) Hall

240. Architecture of North America. A study illustrating the transplantation of European architectural customs since the sixteenth century;

the time lag in transit and acceptance of later European developments; the gradual assumption of confident independence in design; and the emergence of international leaders in the United States. 3 s.h. (E) Hall

249. Pre-Columbian Art. The architecture, sculpture, pottery, and other arts of the indigenous civilizations in Mexico, Central America, and the Andean region of South America before the Spanish conquest. 3 s.h. (w) Markman

250. Latin American Art. The architecture, painting, and other arts of Latin America from colonial times to the present. Emphasis on the architecture of the colonial period. 3 s.h. (w) Markman

251, **252**. Research. A course designed to give instruction in methods used in the investigations of original problems. It is open to seniors by permission of the Director of Undergraduate Studies. 6 s.h. *Heckscher*

292. Research Problems in the Collections of the North Carolina Museum of Art. A specialized study of selected art works in the collections of the North Carolina Museum of Art. Students will meet once every week in the museum in Raleigh. In completion of the course each student will submit a report on his particular research project. 3 s.h. (E) Bier

Design

Students other than art majors may receive not more than eight semester hours credit for work in studio courses. For any number of semester hours of credit in studio courses an equal number of hours must be taken in History and Criticism.

53-54. Beginning Studio. A studio course offering experiment and practice with formal elements of composition in various media. Particular emphasis will be given to drawing; watercolor, collage, and three-dimensional media will be secondarily considered. 6 s.h. (E) Pratt

55, 56. Painting. A studio course designed to give experience in painting media with individual and group criticism, and discussion of important historic or contemporary ideas in painting as related to student work. Prerequisite: Art 53-54 or consent of the instructor. 4 s.h. (E) Pratt

157, 158. Advanced Painting. Emphasis is given to the techniques of various painting and design media. Prerequisite: 55, 56. 4 s.h. (E) Pratt

159, 160. Printmaking. This course presupposes a knowledge of design and skill in drawing. Practice in wood engraving; block printing; and in copperplate engraving, etching, acquatint, and drypoint. Reference will be made to prints in relation to the design of the book, and historic examples of the art of the print will be analyzed in the study of these techniques. Prerequisite: 53-54. 4 s.h. (E) Mueller

Departmental Major in Art

Prerequisite. Introduction to Art History (1-2 or 51-52); or, with the approval of the Director of Undergraduate Studies, equivalent hours in 100 level courses which form a background for the History of Art.

Major Requirements. The student will select in consultation with the departmental adviser a sequence of courses emphasizing either the History of Art or Design.

- a. History of Art: 24 semester hours from 100 and 200 level courses distributed over the entire field of Art History, with a concentration of courses in at least two areas.
- b. Design: 22 semester hours, of which 16 must be in Design and 6 from courses in the History of Art and Theory.

Related Work. 18 semester hours elected from courses in aesthetics, anthropology, English, German, classical studies, history, history of music, history of religion, linguistics, philosophy, psychology, romance languages, and sociology.

The Department offers work leading to graduation with distinction.

See the Section on honors in this *Bulletin*.

Studio Fees. A fee of \$15.00 per semester will be required in all studio courses to cover materials used in each course. The fee is payable to the Treasurer's Office upon notification from that office at the beginning of each semester.

Biology

1-2. *Biology*. An introduction to the principles of biology, including organic systems from molecules to communities. Lectures, laboratories, and discussions. 8 s.h. (w) Staff

See other courses listed under Botany and Zoology.

Botany

Professor Johnson, Chairman; Associate Professor Wilbur, Director of Undergraduate Studies; Associate Professor Stone and Assistant Professor White, Supervisors of Freshman Instruction; Professors Anderson, Billings, Harrar, Hellmers, Kramer, Naylor, Oosting, and Perry; Associate Professors Culberson and Philpott; Assistant Professors Bryan and Searles

1-2. Biology. (See course listing under Biology 1-2.)

52. Plant Identification. Practice in the identification of local plants and a study of the principles underlying plant classification. Laboratory, lectures, and field trips. 4 s.h. (w) Wilbur

53. Introductory Oceanography. Basic principles of physical, chemical, biological and geological oceanography. Prerequisite: one year of a laboratory science or concurrent enrollment in a laboratory science. (Also listed as Geology 53) 3 s.h. Pilkey (Geology) and Searles

55. Plant Anatomy. A comparative study of basic cell types, tissues and organs of vascular plants. Correlation of anatomical information with pertinent literature, and application of anatomy to problems in systematics and evolution, and the interrelationship between structure and function. Prerequisite: one year of biology or permission of instructor. 4 s.h. White

101. Principles of Heredity. The basic principles of heredity and their significance. Lectures, three hours; laboratory, two hours; conference, one hour. Laboratory work includes experimental breeding of the fruit fly. May be taken as a lecture course without laboratory. Prerequisite: one (high-school or college) course in biology, botany, or zoology. Highschool algebra or one year of college mathematics recommended. 3 (without laboratory) or 4 s.h. (w)

103. General Bacteriology. A study of the morphology and fundamental physiological processes of bacteria: their relationship to sanitation, public health, soil fertility, and food preservation. Prerequisite: one year of biology or chemistry or equivalent. 4 s.h. (w) Johnson

105. Plant Morphology. Vegetative organization and reproductive cycles of major plant group representatives. Main theories of evolutionary origin and phylogenetic interrelationships. Prerequisite: One year of biology, 4 s.h. Culberson

151. Introductory Plant Physiology. The principal physiological processes of plants, including water relations, mineral nutrition, synthesis and use of foods, and growth phenomena. Prerequisite: Biology 1-2 or

equivalent; one year of chemistry. 3 s.h. (w) Kramer

156. Plant Ecology. Principles of the relationships between plants and their environment. The structure and processes of typical ecosystems. Laboratory, lectures, and field trips. Prerequisites: Biology 1-2 and Botany 52, or equivalent. 4 s.h. (w) Billings

191, 192, 193, 194. Independent Study. Directed reading and research. Open only to highly qualified students in the junior and senior years by

permission of the Department. See page 55. 6 s.h.

202. Genetics. The principles of heredity, their cytological basis, and their bearing on other fields of biology. Laboratory work involves experimental breeding of the fruit fly and interpretation of data from the breeding of plants. Offered in alternate years. Prerequisites: one year of biology, or equivalent, and one year of college mathematics. 4 s.h. (w) Perry

209. Lichenology. Morphology, systematics, and biological and ecological implications of the lichens. Collection and identification of specimens and the use of lichen chemistry in taxonomy. 3 s.h. (w) Culberson

210. Bryology. Morphological, systematic and ecological characteristics

of mosses and liverworts. 3 s.h. Anderson

212. Phycology. Morphological and ecological characteristics of common freshwater and marine algae and principles of their classification. Collection, identification and preparation of permanent specimens. 3 s.h. Searles

- 221. Mycology. Field and laboratory study of vegetative and reproductive structures of the fungi and slime molds. Methods of collection, isolation, propagation, and identification of the major orders as represented in the local flora. Prerequisite: One year of biological science. 4 s.h. (w) **Iohnson**
- 225, 226. Special Problems. Students with adequate training may do special work in the following fields:
 - 1. Mycology and Plant Pathology. Johnson
 - 2. Cytology. Anderson and Bryan

3. Ecology. Oosting and Billings 4. Genetics. Perry

5. Morphology and Anatomy of Vascular Plants. Philpott and White

- 6. Bryology. Anderson and Bryan 7. Physiology. Hellmers, Kramer and Naylor
- 8. Taxonomy of Vascular Plants. Stone and Wilbur
- 9. Bacteriology. Johnson
- 10. Lichenology. Culberson
- 11. Phycology. Searles
- 240. Evolution. Analysis of the processes of adaptation and evolution in individuals, populations, and genetic systems. Prerequisites: Introductory biology and genetics, or consent of instructor. Cytology recommended. 3 s.h. (w) Klopfer (Zoology) and Stone

243. Cytology. The structural and functional organization of cells. Lectures, readings, and laboratory work. Prerequisite: one year of botany or zoology. (This is the same course as Zoology 243.) 4 s.h. (w)

Anderson and Nicklas (Zoology)

250. Plant Biosystematics. Basic descriptive and experimental procedures for the study of vascular plant evolution. Prerequisites: Botany 52 and 55 and either 243 or a course in genetics or their equivalents. 4 s.h. Stone and White

252. Plant Metabolism. The physiochemical processes and conditions underlying the physiological processes of plants. Prerequisite: Botany 151 or equivalent; organic chemistry recommended. 4 s.h. (w) Naylor

254. Plant Water Relations. A study of factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Assigned readings, reports, and lectures. Prerequisite: Botany 151 or equivalent. 3 s.h. (w) Kramer

255. Plant Systematics. A study of the historical background of plant

taxonomy, modern concepts and systems of classification, nomenclatural problems, and the taxonomy of specialized groups. Prerequisite: Botany

52 or equivalent. 4 s.h. (w) Wilbur

256. Community Analysis and Classification. The development of concepts and methods in synecology and their present application to the study of plant communities. Prerequisite: Botany 156 or equivalent. 3 s.h. (w) Oosting

257. Principles of Plant Distribution. Interpretation of floristic and ecological plant geography of world vegetation. Prerequisite: Botany 156

or equivalent. 3 s.h. (w) Billings

258. Physiology of Growth and Development. Consideration of the internal factors and processes leading to the production of new protoplasm and its differentiation at the cellular, tissue and organ level in plants. Prerequisite: Botany 151 or equivalent; organic chemistry recommended. 4 s.h. (w) Naylor

259. The Environment. Environmental principles; methods of obtaining and evaluating environmental data for ecological purposes with special attention to instrumentation and microclimate. Prerequisite:

Botany 156 or equivalent. 3 s.h. (w) Billings

Marine Laboratory. Botany 211, Marine Algae, and 207, Marine Mycology, are given alternate years at the Duke University Marine Laboratory, Beaufort, N. C.; Botany 220, Coastal Field Botany, is offered biennially. Consult the Bulletin of the Marine Laboratory.

Departmental Major

Prerequisites. Biology 1 and 2.

Major Requirements. A minimum of 24 hours (A.B. and B.S.) of work beyond Biology 1 and 2, including at least four of the following courses: Botany 52 (Systematics), 55 (Anatomy), 105 (Morphology), 101 (Principles of Heredity), 151 (Physiology) and 156 (Ecology). The remaining hours may be selected from these and any other courses in the Department for which the student is eligible, subject to approval of the Director of Undergraduate Studies.

Related Work. Courses in at least two natural science departments sufficient to total, with major work, 42 s.h. (A.B.) or 48 s.h. (B.S.)

Chemistry

Professor Bradsher, Chairman; Associate Professor Bonk, Director of Undergraduate Studies; Professors Brown, Hill, Hobbs, Krigbaum, Strobel, and Wilder; Associate Professors Chestnut, Poirier, Quin, and Smith; Assistant Professors Jeffs, Jones, Palmer, Toren, and Wells; and Assistants

1, 2. General Inorganic Chemistry. Lectures and recitations on the elementary principles of chemistry and on the structure, properties, preparation and uses of the elements and their compounds. The laboratory work includes qualitative analysis of some of the more common metals. Two lectures, one recitation, and three laboratory hours throughout the year. Chemistry 1 is a prerequisite for Chemistry 2. Prerequisite: Qualification

for Math 21. 8 s.h. (E & w) Bonk, Staff and Assistants

41, 42. Advanced General Chemistry. More theoretical than Chemistry 1, 2; emphasizes atomic and molecular structure, chemical kinetics, elementary thermodynamics, and chemical equilibria with special attention in the second semester to the physical chemistry of aqueous solutions. In the first semester a series of modest research experiments constitute the major part of the laboratory program; in the second semester experiments illustrate the principles of chemical equilibria and the techniques of quantitative and instrumental analysis. Credit is not awarded for both Chemistry 2 and 42 nor for both 42 and 61. Prerequisites: Mathematics 21, which may be taken concurrently, and permission of the instructor. For Chemistry 42, Chemistry 41 is a prerequisite; however, invitations to Chemistry 42 will be extended to students who have had excellent records in Chemistry 1. 8 s.h. (w) Strobel and Wilder

61. Physical Chemistry of Aqueous Solutions. An intensive study of chemical equilibria with special attention to the physical chemistry of aqueous solutions, ionic and molecular structure, and elementary thermodynamics. Laboratory experiments illustrate the principles of gravimetric, volumetric, and instrumental analysis. One lecture, one recitation, and six laboratory hours. Prerequisites: Chemistry 1, 2 and Mathematics 21. 4

s.h. (w) Wilder, Jones, Poirier, Toren and Assistants

70. Quantitative Analysis. A study of the theory and techniques of gravimetric, volumetric, and instrumental methods of analysis. One lecture, one recitation, and six laboratory hours. Not open to B.S. Chemistry majors. Prerequisite: Chemistry 42 or 61. 4 s.h. (w) Toren, Wells and Assistants

132. Quantitative and Instrumental Analysis. Practice in advanced quantitative analysis and in the use of chemical instrumentation in analysis. A discussion of the theoretical and applied aspects of chemical and instrumental methods of analysis. Prerequisites: Chemistry 161, 162, the latter half of which may be taken concurrently. 4 s.h. (w) Toren

151, 152. Organic Chemistry. An introduction to the study of the compounds of carbon in which the chemistry of both aliphatic and aromatic compounds is considered. Laboratory experiments are selected to illustrate the more important reactions and preparations of organic compounds. Two lectures, one recitation, and three laboratory hours. Prerequisite: Chemistry 42 or 61. Chemistry 151 is prerequisite for 152. 8 s.h. (w) Bradsher, Miss Brown, Jeffs, Quin, and Assistants

160. Elements of Theoretical Chemistry. A one semester course in the

principles of physical chemistry. Credit is not given for both 160 or 161 and 162. Three recitation and three laboratory hours. Prerequisites: Chemistry 70, Physics 41-42, and Mathematics 22. 4 s.h. (w) Smith

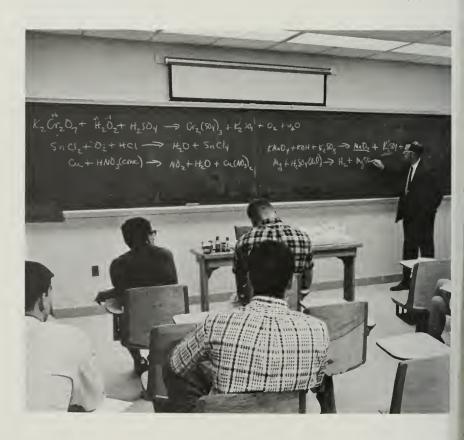
161, 162. Physical Chemistry. Fundamentals of theoretical chemistry illustrated by selected laboratory experiments. Three recitations and three laboratory hours. Prerequisites: Chemistry 42 or 61, Physics 41-42, and Mathematics 63. 8 s.h. (w) Hobbs

191, 192. Independent Study. Directed reading and research. Open only to highly qualified students by permission of the department. (See

page 56.) Prerequisite: Chemistry 271

216. Nuclear Chemistry. Elementary theory of nuclear reactions and properties of radioisotopes. Main emphasis on tracer techniques and interpretation of tracer studies. Two recitations and three laboratory hours. Prerequisites: Chemistry 70 or 132, 152, and Physics 41-42. 3 s.h. (w) Hill

217. Inorganic Chemistry. An advanced study of the bonding, structures, and reactions of inorganic compounds based on modern physical



chemical concepts. Three lectures. Prerequisite: Chemistry 162 or the permission of the Director of Undergraduate Studies. 3 s.h. (w) Wells

234. Chemical Instrumentation. Discussion of the principles of instrument design, electronics, and chemical measurements with emphasis on optical methods. One lecture and three laboratory hours. Prerequisite: Chemistry 132, which may be taken concurrently, or an equivalent course. 2 s.h. (w) Strobel

235. Advanced Analytical Chemistry. A theoretical and applied treatment of chemical kinetics, electrode processes, multi-stage separations, organic reagents, and functional group chemistry as related to modern analytical techniques. Prerequisite: Chemistry 132 and 162. 3 s.h. (w)

Toren

251. Qualitative Organic Analysis. Systematic identification of organic compounds based upon a study of physical and chemical properties. Infrared and ultraviolet absorption spectra are used in elucidation of structure. One lecture and six laboratory hours per week. Prerequisite: Chem-

istry 152. 3 s.h. (w) Quin and Jeffs

252. Advanced Organic Preparations. A laboratory course designed to supplement the student's knowledge of fundamental organic processes by a selected group of laboratory experiments accompanied by discussions of techniques and theories pertinent to the experiments. Five hours laboratory and lecture with lectures in alternate weeks. Prerequisite: Chemistry 152. 2 s.h. (w) Miss Brown

253. Intermediate Organic Chemistry. An advanced study of the reactions of organic compounds and the theories of organic chemistry. Prerequisite: Chemistry 152 and permission of the Director of Undergraduate

Studies. 3 s.h. (w) Quin and Wilder

255. Structural Analysis by Spectroscopic Methods. Ultraviolet, infrared, nuclear magnetic resonance and mass spectroscopy as applied to the determination of the structure of organic compounds. Prerequisites: Chemistry 152 and permission of the Director of Undergraduate Studies.

2 s.h. (w) Jeffs

263. Thermodynamics. Review of classical thermodynamics, including application of chemical potentials to the treatment of equilibria in multicomponent systems. Elementary statistical thermodynamics; use of partition functions for the ideal monatomic gas, harmonic oscillators, and rigid rotators. Derivation of Debye-Huckel equation; special topics. Prerequisites: Chemistry 162 and permission of the Director of Undergraduate Studies. 3 s.h. (w) Krigbaum

267. Introductory Quantum Chemistry. Fundamentals of quantum mechanics and orbital methods of molecular structure and spectra. Prerequisites: Chemistry 162 and permission of the Director of Undergrad-

uate Studies. 3 s.h. (w) Iones

271. Introduction to Research. Lectures on the use of chemical litera-

ture and on special areas of chemical research. Oral and written reports by the students on topics selected from current chemical literature. One lecture. 1 s.h. (w) Miss Brown

275-276. Research. A course designed to give instruction in methods used in the investigation of original problems. It is open to seniors by permission of the Director of Undergraduate Studies. 1 to 3 s.h. (w) Staff

Departmental Major

For the degree of A.B.

Prerequisites. Chemistry 1 and 2 (or 41), Mathematics 21, 22.

Major Requirements. 22 s.h., including Chemistry 61 (or 42), 70, 151, 152, and an additional 6 to 8 s.h., which may be satisfied by 161-162 or 160 together with 2 or 3 s.h. selected from the courses 216, 234, 251, and 252.

Related Work. 20 s.h., including Physics 41-42 with the remainder usually in botany, geology, mathematics, physics or zoology.

For the degree of B.S.

Prerequisites. Chemistry 1 and 2 (or 41), Mathematics 21, 22, 63.

Major Requirements. Chemistry 61 (or 42), 132, 151, 152, 161, 162, 217, 251, and 216 or 234 or 252.

Related Work. 18 s.h., including Physics, 11 s.h. and Mathematics 51, or 64 or 131.

The language requirements must be satisfied by German 64 and either French 2 or Russian 2.

The department offers work leading to graduation with distinction. Consult the section on Honors and Prizes in this *Bulletin*.

Chinese

(Elementary Chinese [101-102] is offered by the University of North Carolina, Chapel Hill. Three semester hours of credit each semester; five hours each week: three of grammar, two of oral practice. Prerequisite: junior standing.)

Classical Studies

Professor Richardson, Chairman; Assistant Professor Stanley, *Director of Undergraduate Studies*; Professors Newton, Rogers, Truesdale, and Willis; Associate Professor Oates; Assistant Professor Womble.

Greek

1-2. Elementary Greek. A study of grammar and an introduction to reading. 6 s.h. Willis

63-64. Intermediate Greek. Introduction to Greek prose and poetry. First semester, Plato's Apology of Socrates and two dialogues; second

semester, two plays of Euripides. 6 s.h. Wooley and Stanley

97, 98. Sight Reading in Greek Prose. Readings from easy Attic prose writers. Open to students who have completed one year of college Greek or the equivalent, with consent of the instructor. Two hours per week throughout the year. 2 s.h.

103. Greek Historians. Selections from Herodotus and Thucydides.

3 s.h. Wooley

104. Greek Orators. Selections from Lysias and Demosthenes. 3 s.h. Truesdale

*105, 106. Homer and the Greek Lyric. First semester, selected books of the Iliad; in the second, portions of the Odyssey and selections from lyric poets. 6 s.h. Truesdale

*107, 108. Greek Tragedy and Comedy. Selected plays from Greek

tragedy and comedy. 6 s.h. Truesdale or Willis

117. Greek Prose Composition. The character of the course is determined by the needs of the students enrolled. 2 s.h. Truesdale

191, 192. Independent Study. Directed reading and research. Open only to highly qualified juniors and seniors. See page 55. 6 s.h. Staff

For Seniors and Graduates

203. Homer. The Iliad and Odyssey; the problems of language and structure in the epic; present state of Homeric scholarship. 3 s.h. Stanley

205. Greek Lyric Poets. Fragments of the early lyric poets; selected

odes of Pindar and Bacchylides. 3 s.h. Truesdale

°206. Aeschylus. The Oresteia with study of the form of Agamemnon and its place in the design of the trilogy. 3 s.h. Willis

*208. Sophocles. The Theban plays; the structure and style of Sopho-

clean tragedy. 3 s.h. Willis

°209. Euripides. Representative tragedies in their political and philosophical context; analysis of dramatic form and texture. 3 s.h.

*210. Aristophanes. Origin and development of Greek comedy; repre-

sentative plays of Aristophanes. 3 s.h. Truesdale

221. Early Greek Prose. Greek prose in the fifth century from the Ionian scientists and logographers to Herodotus; Gorgias, Antiphon, Willis and the Old Oligarch. 3 s.h.

*222. Thucydides. The History; Thucydides' historical method and

style. 3 s.h.

*223. Greek Orators I. Early fourth century rhetoric, including Ando-

cides, Lysias, and Isocrates. 3 s.h. Wooley

*224. Greek Orators II. Aeschines' Against Ctesiphon and Demosthenes' On the Crown in the light of fourth century political history and rhetorical development. 3 s.h.

225. Plato. Selected dialogues and related passages illustrating the development of philosophical topics and stylistic motifs. 3 s.h. Wooley

*231. Hellenistic Poetry. The principal lyric, clegiac, pastoral, and didactic poets of Alexandria; emphasis on Callimachus and Theocritus. Stanley

*241. Advanced Prose Composition. Xenophon, Lysias and other prose authors as models of style and practice in the writing of Attic prose. 1

s.h. Willis

Latin

1-2. Elementary Latin. Study of the structure of the language (inflexions, vocabulary, syntax, and pronunciation). Second semester: readings in Terence and Caesar. 8 s.h. Womble

63. Intermediate Latin: Cicero. Selected speeches of Cicero: their form and prose style, the historical background, and the conventions of the courts and Roman Senate. Prerequisite: Latin 1-2 or the equivalent. (Open to students offering 3 units of school Latin and students offering 2 units of school Latin with a record satisfactory to the department.) 4 Richardson

64. Intermediate Latin: Vergil. Readings from the Aeneid, Books 1-6; lectures on the epic and its history and Vergil's style and technique. 4 Richardson.

91, 92. Latin Prose and Poetry. The reading of Latin as literature with particular emphasis on form and style. First semester: Catullus and the Pro Caelio of Cicero; second scmester: the Odes of Horace and the historical works of Sallust or Livy. 6 s.h. Richardson, Stanley, and Wooley

93. Roman Comedy. The plays of Plautus and Terence. 3 s.h.

94. The Roman Novel. Petronius' Satyricon and Apuleius' Metamorphoses. 3 s.h.

*95. Roman Stoicism. Representative works, such as Cicero's De

Finibus and Seneca's Moral Epistles. 3 s.h.

*96. Roman Epicureanism. The De Rerum Natura of Lucretius. 3 s.h. 97, 98. Sight Reading in Classical, Mediaeval, and Renaissance Latin. Offered especially for students in fields other than Classical Studies who wish to maintain and refresh their Latin. Two hours per week throughout the year. (Open to students enrolled in other courses in Latin only on the recommendation of their instructors.) 2 s.h.

*107. Roman Elegy: Propertius and Tibullus. 3 s.h.

*108. Ovid. 3 s.h.

109. The Roman Historians: Caesar and Sallust. 3 s.h. Rogers

110. The Roman Historians: Livy and Tacitus. 3 s.h. Rogers

117. Latin Prose Composition. The character of the eourse is determined by the needs of the students enrolled. 2 s.h. Richardson

191, 192. Independent Study. Directed reading and research. Open to highly qualified juniors and seniors. See page 55. 6 s.h.

For Seniors and Graduates

201. The Verse Treatise. The genre of didactic poetry; emphasis on Lucretius' De Rerum Natura, Vergil's Georgics, and Ovid's Ars Amatoria; attention to Cicero's Aratea, the Astronomica of Manilius, Horace's Ars Poetica and Ovid's Fasti. 3 s.h. Richardson

*202. Roman Satire. A survey of the genre, with eoneentration on

Horace, Juvenal, and Persius. 3 s.h. Womble

*203. Epic: Vergil. The Aeneid. 3 s.h. Richardson

°204. Epic: Lucan and Statius. The development of the Roman epic in the Silver Age. 3 s.h. Richardson

*207. The Prose Epistle. The letter as a vehicle of communication and

as a literary form. 3 s.h. Richardson

*208. The Epistle in Verse. The verse letter as a literary form; reading in the Epistles of Horace, the Heroides of Ovid, and Statius. 3 s.h. Womble

°209. Fragments of Early Latin. The remains of Latin poetry of the third and second centuries B.C., from Livius Andronicus to Lucilius, with emphasis on the epic and drama of Ennius. 3 s.h. Stanley

210. Lyric and Occasional Poetry. Shorter verse forms: epigram, pas-

toral, song, and panegyrie. 3 s.h. Womble

211. Roman Oratory I. The literary history and criticism of Roman oratory. 3 s.h. Rogers

212. Roman Oratory II. A continuation of Latin 211. 3 s.h. Rogers 221. Mediaeval Latin I. Latin literature of late antiquity, from Pru-

dentius to the Carolingian Revival. 3 s.h. Newton

222. Mediaeval Latin II. Literature in Latin from Charlemagne to the

Renaissance. 3 s.h. Newton

*241. Advanced Latin Composition. Experiments in imitation of the great Latin prose styles and introduction to the composition of verse. 1 s.h. Richardson

Classical Studies

Courses on the 100-level are open to juniors and seniors, and to qualified sophomores by permission of the instructor.

15. Mythology. A study of Greek myth and its eultural survivals.

Open primarily to freshmen. 3 s.h. Truesdale

111, 112. Roman Literature in English Translation. First semester: selective reading in important works of drama, lyric poetry, and Cicero;

second semester: epic, satire, and the novel. 6 s.h. Womble

121, 122. Greek Literature in English Translation. First semester, the Iliad and Odyssey are studied in detail and related to their historical and literary background; second semester, a study of Greek drama, with analysis of major plays of Aeschylus, Sophocles and Euripides. 6 s.h. Truesdale

129. Greek History. The Greek world from the Late Bronze Age to the

Roman conquest. 3 s.h. Oates

132. Roman History. The Roman State to the death of Justinian; its expansion; development of its constitution and public administration; social, legal, political and economic problems; the background and setting

of Christianity's rise and growth. 3 s.h. Rogers

141, 142. Classical Art and Archaeology. Greek architecture, sculpture, and painting, with study of the objects in the Duke Classical Collection. First semester, from the Bronze Age to the classical period; second semester, from the later classical period to the Roman era. Not open to students who have had Art 131, 132. 6 s.h. Stanley

For Seniors and Graduates

231. Greek Sculpture. Techniques and styles of the major schools and personalities in archaic, classical, and Hellenistic free-standing and architectural sculpture. 3 s.h. Stanley

232. Greek Painting. Techniques and style in the various media; emphasis on the problems of chronology, attribution, and iconography of

Attic pottery. 3 s.h. Stanley

- 235. Roman Architecture. Significant monuments chosen to exemplify the Roman genius in building in the late Republic and early empire. 3 s.h. Richardson
- 236. Roman Painting. Roman pictorial art with concentration on the wall-paintings from Campania and Pompeii. Investigation of techniques, iconography, and the use of pictures in decoration. 3 s.h. *Richardson*

253. Greece to the Orientalizing Period. 3 s.h.

254. The Age of the Tyrants and the Persian Wars. 3 s.h.

*255. The Age of Pericles. 3 s.h.

*256. The Fourth Century through Alexander. 3 s.h.

257-258. Social and Cultural History of the Ancient World. First semester: the Hellenistic world from Alexander to Augustus; second semester: the Roman Empire as the trustee of Hellenism and Christianity and its own contribution to modern civilization. 6 s.h. Rogers

*260. The History of Rome to 146 B.C. 3 s.h. 261. The Roman Revolution, 146-30 B.C. 3 s.h. 262. Rome under the Julio-Claudians. 3 s.h.

*263. From the Flavian Dynasty to the Severan. 3 s.h.

Note: Courses indicated by an asterisk (*) will not be offered in 1967-68.

Departmental Major in Greek

Prerequisite. Greek 1-2 or equivalent.

Major requirements. 24 semester hours in courses in Greek, to be selected from 63-64 and courses numbered above 100; at least 6 hours of work must be taken in courses at the 200-level. Students will be required to pass an examination testing proficiency in Greek prose composition or to complete Greek 117.

Related work. 18 semester hours, including at least 6 hours of Latin, and 12 hours of suitable courses in archaeology, ancient and mediaeval

history, Linguistics, French, German, or philosophy.

Departmental Major in Latin

Prerequisite. Latin 91, 92.

Major requirements. 24 semester hours in courses of Latin, which must include 12 semester hours in courses among those numbered 93-96 and those at the 100-level, and 12 semester hours in courses at the 200level. Students will be required to pass an examination testing proficiency in Latin Composition or to complete Latin 117.

Related work. 18 semester hours, including at least 6 hours of Greek, and 12 hours of suitable courses in archaeology, ancient and mediaeval

history, Linguistics, French, German, or philosophy.

Majors in either Greek or Latin who contemplate graduate work are reminded of the necessity for competence in both languages for all higher degrees and of the requirement for a reading knowledge of French and German (usually an examination in one of these languages must be passed in the first year of graduate work and an examination in the other

the second year).

Majors in Greek and Latin are eligible for nomination to a term of one semester during their junior year at the Intercollegiate Center for Classical Studies in Rome, of which Duke University is a founding member, at a cost comparable to that of a semester at Duke. Financial arrangements are made through the University, and students may apply for scholarship assistance. Courses in Greek, Latin, Ancient History, and Archaeology taken at the Center are counted toward the degree requirements of the Department of Classical Studies. For further information, see page 28.

Graduates of Duke University may attend the American School of Classical Studies at Athens, Greece, without charge for tuition and are eligible to compete for the fellowships offered annually by the School. These consist of two fellowships in Greek archaeology and one in the language, literature, and history of ancient Greece, each with a stipend of \$2,500. They are awarded mainly on the basis of examinations held in the beginning of February of each year. A somewhat similar connection exists with the American Academy in Rome.

Comparative Literature

The courses in Comparative Literature may be taken as electives by advanced students; certain courses serve as related work in several departments (see the entries for related work under the separate departments).

No major work is offered in Comparative Literature. Students interested in the study of the interrelationships of literature as a part of their undergraduate program, or as preparation for graduate work, should consult Mr. Salinger.

191, 192. Independent Study. Directed reading and research. Open only to qualified students in the junior year, by permission. See p. 56.

193, 194. Independent Study. Directed reading and research. Open only to qualified students in the senior year, by permission. See p. 56.

6 s.h. Salinger

201, 202. Romanticism. Studies in the origin, rise, and development of the Romantic Movement in the chief literatures of the Western World. The approach is comparative; the principal emphasis will be on England, France, and Germany, with some reference to other countries. Selected subjects will be covered in occasional lectures by speakers from various departments of the University. 6 s.h. Salinger

203, 204. Realism and Symbolism. Comparative studies in the literatures of England, France, Germany, Russia, the Scandinavian countries, Spain and Italy, tracing the decline of romantic individualism and the reappraisal of man's significance against the social background. Selected subjects will be covered in occasional lectures by speakers from various

departments of the University. 6 s.h. Salinger

205. Foundations of Twentieth-Century European Literature. The roots of the contemporary scene (Proust, Mann, Rilke, Kafka, Eyvind Johnson, Lagerkvist, Anouilh, Camus) evolving toward a mythology of man. 3 s.h. Salinger

For a description of the following courses see the departmental listing. Readings in European Literature. (English 153, 154). Krueger Modern European Drama. (English 155) Reardon Readings in Scandinavian Literature. (English 159) Anderson The European Epic Tradition. (English 167, 168) Knight

Religious Values in Classical and European Literature. (Religion 187). Kort

Economics and Business Administration

Professor Smith, Chairman; Associate Professor Kreps, Director of Undergraduate Studies; Professors Black, de Vyver, Davies, Dickens, Ferguson, Hanna, Hoover, Joerg, McGee, Rottenberg, Saville, Spengler and Yohe; Visiting Professors Langenderfer and McColl; Associate Professors Blackburn, De Alessi, Goodwin, Keller, and Naylor; Visiting Associate Professor Lindloff; Assistant Professors Condos, Finger, Reed, Vernon, and Wallace; Visiting Assistant Professor (Part-time) Galifianakis.

The courses offered by the Department are listed under three divisions, Economics, Accounting, and Business Administration. After the present (1966-67) academic year courses in Economics will be offered in the Department of Economics and courses in Accounting and Business Administration will be offered in the Department of Business Administra-

In general, the Economics courses aim to develop in the student such critical and analytical skills as underlie the ability to understand economic problems and institutions, both in their contemporary and in their historical setting. While no particular vocational or professional goal is emphasized, these courses furnish the academic background necessary for many positions in industry, for work in the economic branches of government service, and for graduate study in economics and the social sciences.

Courses in Accounting and Business Administration, although more concerned with general principles than with specific applications, stress in greater measure than courses in Economics the knowledge and techniques useful to students definitely preparing for business careers. The student who majors in Accounting may elect courses in accountancy, business law, and related work, sufficient to qualify for admission to C.P.A. examinations.

Economics 1 or 51 and 2 or 52 are recommended to all students planning to elect further courses in Economics and Business Administration.

Economics

1. Introduction to Economic Problems and Policies. The present-day American economy and the challenge from centrally planned economies; policies to deal with problems of depression, inflation, growth, and automation. 3 s.h. (E & w) (Open only to Freshmen.)

2. The Evolution of Economic Ideas. A study of man's economic activities and his ideas about them, from the ancient world to the present day. Emphasis is given to the historical roots of important contemporary economic ideologies. 3 s.h. (E & W) (Open only to Freshmen.) Staff

51. Principles of Economics. Examination of the main features of the American economy, measurement of national income, and analysis of forces determining national output and income; fluctuation and growth of output, monetary and fiscal policies for stability and growth. 3 s.h. (E & W) Staff

52. Principles of Economics. Examination of forces determining prices and production of goods, distribution of income; problems of agriculture, labor, international trade, economic development, and government in

relation to business. 3 s.h. (E & W) Staff

109. Economic Geography of Latin America. This course involves comprehensive study of the resources and people of Mexico, the West Indies, and Central and South America. Special emphasis is placed upon the possibilities and limitations of increases in trade between the United States and the leading Latin-American countries. 3 s.h. (E)

114. Economic Geography of Africa. A continental study of the natural environmental factors of Africa and the basic economic patterns of adjustments and adaptations on regional or national bases. 3 s.h. (E)

Tuthill

115. Fundamentals of Geography. A functional social studies approach to geographic factors and their inter-relationships. 3 s.h. (E) Tuthill

120. Economic Geography of Southern Asia. Concepts of agricultural, manufacturing, and distributive location theory, resource evaluation and

regional planning in Southern Asia. 3 s.h. Reed

132. The Economic History of the United States. Development of economic institutions as the United States passed from a wilderness area to an industrial society. Special attention is given to measures of economic change and their application to models of economic growth and fluctuation. 3 s.h. (w) Saville

149. The Theory of the Firm. Cost and supply considerations in price theory, the demand for factors of production. The allocation of resources is examined in the context of competitive and monopolistic market struc-

tures. 3 s.h. (w) de Alessi, Finger

150. Economic Thought Since Adam Smith. A course of readings in leading economic writers of the nineteenth and twentieth centuries. 3 s.h. (w) Goodwin

151. Urban Geography. Analysis of systems of cities; their location, size, functions, internal organization, growth, and approaches to urban

planning. 3 s.h. Reed

153. Money and Banking. The lender's side of financial markets. The activities of commercial banks and other financial institutions in supplying loanable funds and the effects of these activities on the money supply and its rate of use, the impact of central bank and Treasury operations on

financial markets, and the evolution of the present monetary system and

its institutions. 3 s.h. (w) Yohe, Condos

154. Aggregative Economics. Concepts and measurement of national income and expenditures, employment, and price levels; the theoretical determination of these aggregates; and applications of macro-economic theory to business cycles and economic growth. 3 s.h. (w) Yohe, Condos

155. Labor Problems. An examination of present-day labor problems followed by an intensive study of methods used by employers and workers

in meeting those problems. 3 s.h. (w) de Vyver, Kreps

160. The Political Economy of Europe: Recent Developments. A study of changing economic relations between European countries and of the changing position of Europe in the world economy after World War II. Selected topics of an interdisciplinary nature will be discussed by visiting lecturers. (w)

161. European Economic Problems. An application of the theory of international economics to the problems of international economic integration with emphasis on the European Common Market. 3 s.h. (w)

- 189. Business and Government. A survey of the public policies which most directly affect the operation of competition in the business world. The course considers the leading philosophies of public control and economic development, the validity of their presuppositions, and their influence on legislation, court decisions and administrative law. 3 s.h. (w) McGee, Vernon
- 201. Senior Seminar in Economics. Problems in theory and applied economics. Readings, reports, and discussion of selected topics. For majors in Economics, with consent of the Department. 3 s.h. (w)

203. Non-western Urbanization. Review of approaches of the various social sciences to the study of urbanization. Research into specific questions and problems of urbanization in non-western areas. 3 s.h.

204. Advanced Money and Banking. Monetary theory and its statistical and institutional implementation. Particular attention is given to the developement of aggregative theories of prices, interest rates and production; the functioning of monetary policy within various theoretical frameworks; and appraisal of the recent use and the limitations of Federal Reserve policy. 3 s.h. (w) Yohe

218. Business Cycles. The characteristics and measurement of cyclical fluctuations in output, employment, and prices; an historical survey of business cycle theories; modern macroeconomic theory and public policy as they relate to business cycles and associated problems of economic

growth; techniques of forecasting cycles. 3 s.h. (w) Yohe

219. Economic Problems of Underdeveloped Areas. Consideration and analysis of the economic and related problems of underdeveloped countries. Some attention will be given to national and international programs designed to accelerate the solution of these problems. 3 s.h.

Rottenberg, Spengler

231. Economic History of Europe. The economic development of Europe from medieval times to the present, treating such topics as the guilds, mercantilism, money, banking, crises, the Industrial Revolution, the interrelationships of government and business, and the economic consequences of war. 3 s.h. (w) Smith

233. State and Local Finance. A study of expenditures, taxation, and financial administration in state and local governments with emphasis on current problems. Special attention will be given to research methods and materials and to the financial relations between state and local governments. Prerequisite: Economics 287 or consent of instructor. 3 s.h. (w)

- 237, 238. Statistical Methods. A study of statistical methods appropriate for dealing with problems in business and social science. In addition to developing more thoroughly the subject considered in Business Statistics, the following methods will be considered: simple, multiple, partial, and curvilinear correlation; curve fitting; probability; sampling distributions; and statistical inference. Prerequisite: Economics 138 or consent of the instructor. Either semester may be taken for credit. 6 s.h. (w) and Wallace
- 243. Econometrics I. Economic theory, mathematics, statistical inference, and electronic computers applied to analysis of economic phenomena. Objective is to give empirical content to economic theory. Matrix algebra used to develop topics in inference, linear regression, and systems of simultaneous equations. Use is made of the electronic computer. 3 s.h. Naylor

244. Econometrics II. A course on the design of computer simulation experiments for economic systems. Topics include generation of stochastic variates, computer models of queueing and inventory systems, models of the firm and industry, models of the economy, simulation lan-

guages, and experimental design. 3 s.h. (w)

257. Dynamics of the Labor Movement. A study of the forces which have shaped the growth of the labor movement. Special emphasis on the origin of modern trade unionism, relating its growth with western philosophic developments, and with the changing economic and social structure of society in Europe and America. 3 s.h. (w)

262. Trade Unionism and Collective Bargaining. An intensive survey of the trade union as an economic institution is followed by a study of the principles and problems of union-management relationship as found in

collective bargaining. 3 s.h. (w) de Vyver

265. International Trade and Finance. A study of fundamental principles of international economic relations. Subjects covered include the economic basis for international specialization and trade, and the economic gains from trade, the balance of international payments, problems of international finance, of international investments, and international

monetary problems. 3 s.h. (w) Finger

268. Competition and Monopoly. A detailed study of the varieties of imperfectly competitive markets, the economic and legal issues which they raise, and the policy solutions which have been attempted in the United States. 3 s.h. (w) McGee

286. Latin American Economics. A survey of the problems of economic

development in twenty countries. 3 s.h. (w)

287. Public Finance. An analysis of the impact of governmental expenditures, revenues, and debt on the allocation of resources, the redistribution of income, and the stabilization of income. 3 s.h. (w) Davies

293. Economic Systems. A study of alternative economic systems. An historical and analytical study of the basic elements of capitalism and of collectivist types of economic systems. Particular attention is given to an analysis of the economic system of Soviet Russia. Prerequisite: permission of the department. 3 s.h. (w)

294. Economic Functions of the State. A continuation of Economics 293. A consideration of the economic functions of society and of the contrasting roles of the state in the various economic systems in carrying on these functions. The Nazi system, the quasisocialized economics of Europe, as well as the modifications of old-tyle capitalism in the United States are analyzed. Prerequisite: Economics 293. 3 s.h. (w)

Accounting

57. Principles of Accounting I. Provides a basic knowledge of accounting and a consideration of financial statements. Attention is focused on the nature and purpose of accounting, the measurement and classification of economic data, and accounting reports as a tool of management and the investor. 3 s.h. Staff

58. Principles of Accounting II. The problems of accounting for the control of monetary assets and costs, the problems of capital stocks and the elementary problems of decision making. The relationship of the firm and national income accounts is examined. Prerequisite: Economics 57. 3 s.h.

171. Accounting Theory. Basic concepts, principles, and postulates are examined and related to the objective of income determination and asset valuation. Financial statements as a source of economic data and investor information are the focal points of the course. Prerequisite: Economics 58. 3 s.h. (w) Keller

172. Corporate Accounts. Deals with the complex problem of capital structure and debt. Considers in detail the effect of fluctuation in the purchasing power of the dollar on business affairs. Examines critically the many faceted problem of measuring and appraising business performance.

Studies the many aspects of business combinations and foreign operations. Prerequisite: Economics 171. 3 s.h. (w) Keller

- 178. Accounting Systems. A presentation of the design and use of basic accounting procedures as applied to specialized business needs. Field trips to selected business units will be arranged. Prerequisite: Economics 171, 172 and the permission of the department. 3 s.h. (w) Dickens
- 180. Governmental Accounting. Accounting principles and methods used in the control and administration of governmental units. Emphasis is placed upon state, county and municipal governments. Prerequisite: Completion of or registration for Economics 171, 172. 3 s.h. (w)
- 273, 274. Auditing, Theory and Practice. A study of basic auditing objectives, standards, ethics, terminology, procedures, and reports. Accounting principles and statement presentation are studied from the viewpoint of the auditor. The place and responsibility of both the internal auditor and the public auditor are studied. Prerequisite: Economics 171, 172 and permission of the department. 6 s.h. (w) Dickens
- 275, 276. Advanced Industrial Accounting and Management. A comprehensive examination of the rationale and techniques of control methods used in industry. Emphasis is laid on a critical evaluation of the practices followed by job-order, process, and standard costing as well as the economics of overhead costs. Prerequisites: Economics 171, 172 and permission of the department. 6 s.h. (w) Black
- 277. Income Tax Accounting. Presentation of the principles of Federal Income Tax laws as related to individuals, partnerships, estates, trusts and corporations. Prerequisite: Completion of or registration for Economics 171, 172. 3 s.h. (w)
- 278. Advanced Problems in Income Taxation. A critical appraisal of selected topics in the law of income taxation as it relates to corporations, partnerships, estates, and trusts. 3 s.h. (w)
- 279. Budgeting and Control. A consideration of methods used in period and project budgeting; the use of accounting, statistical, and mathematical methods in cost control; the use of numerical data in making decisions among alternative courses of action. 3 s.h. (w)
- 295, 296. Advanced Accounting Seminar-Theory and Practice. Thorough practice in classroom to prepare candidates for the Certified Public Accountant examination. The object is to train students to apply accounting principles and to work in classroom under substantially the same conditions as in the examination rooms. Practical accounting problems, auditing analysis and theory of accounts. Prerequisite: Economics 171, 172 and permission of the department. (Those who do not wish credit may take Economics 295, 296 for \$25.00 per semester.) 6 s.h. (w) Black

Business Administration

138. Business Statistics. A survey of the principal statistical methods and their application to economics and business administration. The course deals with collection of statistical data, construction of statistical tables and charts, and a brief study of the fundamental statistical concepts and techniques. Offered both semesters. 3 s.h. (w) Wallace

Open to juniors and to sophomores in the second semester. Not open to seniors except with permission of the Director of Undergraduate Studies.

143. Corporation Finance. Principles and problems in the financial organization of corporations; the study of corporate securities, the management of capital, the distribution of earnings; industrial combinations; insolvency and reorganization. Prerequisite: Economics 57. Offered both semesters. 3 s.h. (w)

144. Investments. A study of the investment policies of individuals and institutions; the securities markets; sources of investment information and data; the analysis and interpretation of financial statements. Prerequi-

sites: Economics 143. 3 s.h. (w)

146. Managerial Economics. Economic analysis of the business firm, its goals, and the economic environment of business. Economic theory of the firm; various mathematical models of the firm; the internal decision making processes. No credit for those who have completed Economics 149. 3 s.h. (w) Naylor, Wallace

181. Business Law. The fundamental principles of law as applied to routine business transactions. The topics presented are: contracts, agency,

and negotiable instruments. 3 s.h. (w) Galifianakis

182. Business Law. A continuation of 181. The topics presented are: partnerships, corporations, sales, personal and real property, mortgages, suretyship, bankruptcy and trade regulation. 3 s.h. (w)

184. Commercial Law for Accountants. A review and summation of commercial law principles as they apply to accounting theory and practice. Emphasis will be placed upon the commercial law sections of the Certified Public Accountant examinations. Students are admitted to the course by permission of the instructor. For seniors. 1 s.h. (w)

185. Business Administrative Organization. An analysis of human behavior in administrative organizations followed by a critical examination of alternative theories of administration and organization as relevant to

the business firm. 3 s.h. (w)

188. Personnel Management. A study of the fundamental principles and problems of labor management and of collective bargaining under modern industrial conditions and under existing labor legislation. 3 s.h. (\mathbf{w})

190. Quantitative Methods in Business. Introduction to operations research. Application of mathematics, statistics, and electronic computers to the solution of management problems. Topics include linear programming, inventory models, queuing theory, Markov processes, and computer

simulation. 3 s.h. (w) Naylor

249. Product Markets. Consumer behavior in price theory, the demand for final products. Relates the firm's demand to the type of market structure, and examines the firm's attempts to predict demand, its attempts to

influence demand, and its price policies. 3 s.h. (w)

291. Business Policy. An integrating course where, through analysis of a series of case problems from the top management viewpoint, the student is given practice in arriving at effective courses of action to solve business problems. To complete this course satisfactorily the student will be required to draw upon the institutional knowledge and techniques acquired in the other courses in the department. Prerequisites: Business Administration requirements through the junior year. 3 s.h. (w) Joerg

Departmental Majors

The Department of Economics and Business Administration offers specialization in three major areas—Accounting, Business Administration and Economics. Each program requires that the student take the same prerequisite courses in the Freshman and Sophomore years.

Prerequisites required of all majors in the Department. Mathematics 17 or 21 (Preferably Mathematics 21). Economics 1 or 51 and 2 or 52. Eco-

nomics 57.

Number of hours needed in each major area. 21 s.h. in addition to Economics 1 or 51 and 2 or 52 and Economics 57.

Economics

Required courses. Economics 138, 149, 154.

Elective courses. Any 12 hours selected from the Economics section (not Accounting or Business Administration) of the Departmental course offerings. Economics 143 and 190 from the Business Administration section may also be offered to meet the Elective requirement.

Business Administration

Required courses. Economics 58 (should be taken in Sophomore year) Economics 138, 143, 146, 291.

Elective courses. 6 hours selected from the following courses. Eco-

nomics 144, 185, 190, 249.

Accounting

Required courses. Economics 58 (should be taken in the Sophomore Year). Economics 138, 143, 171, 172, 273, 275.

Related work. 18 s.h. Departments in which related work is usually taken: mathematics, the other social sciences, history, and psychology. In

special cases courses taken in other departments may be counted as related work with the approval of the Department and the dean.

The Department offers work leading to graduation with distinction. See

the section on Honors.

Education

Professor Nelson, Chairman; Professor Stumpf, Director of Undergraduate Studies; Professors Bolmeier, Cartwright, Githens, Hopkins, Hurlburt, and Petty; Associate Professors Colver, Gehman, Johnson, Rudisill, Shuman, Spaulding, Sublett, and Weitz; Assistant Professors Ballantyne, Carbone, Flowers, Fulbright, Martin, and Simono; Lecturer Engelhart; Adjunct Associate Professor Anastasiow

Courses in the Department of Education are designed for two groups of students: (1) students who have definitely chosen teaching as their life work or others with teaching experience, and (2) students who desire to

study the school as a unique social institution.

Students who expect to teach in the public schools should plan their courses in accordance with the general regulations set forth under Teaching. Students who intend to teach in elementary schools should advise with Professors Petty, Sublett, or Stumpf; those intending to teach in secondary schools should advise with Professors Cartwright, Githens, Hurlburt, Shuman, or Stumpf. Students should confer with these advisers prior to registration each semester.

Students who do not expect to teach but desire an understanding of the school as part of a liberal education are advised to elect such courses as Education 100, 113, 114 for their introductory work in the Department and then to elect further work in accordance with their special interests.

68. Mental Hygiene. Development and application of psychological principles of adjustment to personal behavior. Study of factors in the development of personal adjustment as influenced by human relations in the home, school, and community. Not open to students who have had

Psychology 115. 3 s.h. (E) Gehman

100. Social Foundations of American Education. A study of the basic features, assumptions, viewpoints, and issues of education in contemporary America. This course or Education 113 is required of all who intend to practice teach and of all majors in Education. This course should be taken in the junior year. Either semester. 3 s.h. (E) Carbone, Johnson, Martin, Stumpf, and Sublett

101. Elementary Education: Principles. The nature, subject matter, and organization of elementary education for instruction in the primary and intermediate grades. Required in the elementary-education major.

2 s.h. (E) Petty, Sublett

102. Elementary Education: Practice. Methods and problems of instruction in elementary education and their applications and solutions in the classroom. Required in the elementary-education major. Prerequisite: 2.0 average over-all and in the elementary-education major. Pre-requisite: Preparation for teaching in the elementary school and/or consent of the instructor. 6 s.h. (E) Petty, Sublett

105. Elementary Education: Reading. The process, methods, and materials basic to the teaching of reading in the elementary school. Re-

quired in the elementary-education major. 2 s.h. (E) Flowers

106. Elementary Education: Language Arts. The processes, methods, and materials basic to the teaching of the language arts in the elementary school. Required in the elementary-education major. Either semester. 2 s.h. (E) Fulbright

107. Elementary Education: Arithmetic. The processes, methods, and materials basic to the teaching of arithmetic in the elementary school.

Required in the elementary-education major. 2 s.h. (E) Petty

108. Elementary Education: Science. The principles, methods, and materials basic to the teaching of the sciences in the elementary school. Required in the elementary-education major. 2 s.h. (E) Githens

113. History of American Education. A study of American education from colonial times to the present. The development of schools, their organization, administration, curriculum, and methods as seen in relation to the social forces that have produced our particular type of civilization. 3 s.h. (E) Johnson

114. History of Education in European Culture. A study of the evolution of educational theory and practice from Greek civilization through 19th-century Europe. Emphasis will be placed upon the educational ideas of outstanding thinkers from Plato to Spencer. 3 s.h. (E) Johnson

118. Educational Psychology. A study of the psychology of learning, individual and social development, and psychology of adjustment as related to problems of instruction and the processes of education. Prerequisite: Psychology 91. 3 s.h. (E) Ballantyne, Gehman, Simono

142. Children's Literature. Students may specialize in literature of

either the primary or the grammar grades. 3 s.h. (E) Flowers

151. Public School Music Education. Required in the elementary-education major. See Music Education 151 for description.

152. Public School Music Literature. Required in the elementary-edu-

cation major. See Music Education 152 for description.

153. Vocal Music in the Public School. See Music Education 153 for description.

154. Instrumental Music in the Public School. See Music Education 154

for description.

161. Integrated Art in the Public School. Work in materials and methods applied in two-dimensional art. Required in the elementary-education major. Either semester. 2 s.h. (E) Stars

- 162. Plastic Art in the Public School. Work in basic three-dimensional art, giving an understanding of different sculptural media with special emphasis on ceramics. The course is designed for students in elementary and secondary art education, and will provide credit toward the North Carolina Elementary and Secondary Teaching Certificates. 3 s.h. (E)
- 201. Teaching and Supervision of Arithmetic. Special attention is given to the number system, the fundamental operations (with whole numbers, fractions, and decimals), percentage, and measurements. Considered also are the meaning theory, methods of teaching, problem solving, evaluation, practice and drill, and selection and gradation of arithmetical contents. This course is designed for teachers and supervisors in the elementary school. 3 s.h. (E) Petty

203. Principles of School Administration. The fundamental facts and procedures of school administration, and analysis of the problems and policies of the organization and direction of a local school system, and the functions of the various school officials. Prerequisite: six semester hours

in education. 3 s.h. (E) Bolmeier, Hurlburt, and Stumpf

204. The School as an Institution. Consideration is given to the place of the school in the American social order, and its adaptation to social, economic, and political changes. Special attention is directed to the responsibility (1) of the school for seeking solutions to the perplexing problems of youth created by a changing society; and (2) of the government for providing greater equality of educational opportunities. 3 s.h. (E) Bolmeier, Martin, Nelson

210. Introduction to Educational Research. The general purpose of this course is to give the student an overview of research, acquaint him with the nature of research processes, and develop within him an understanding of the essential characteristics of good research work. The course is designed to be liberalizing as well as technical. 3 s.h. (E)

Stumpf

215. Secondary Education: Principles. Intensive study of principles, curriculum, and methods in secondary education. Accelerated course meeting six hours a week for half a semester. Prerequisite: 2.0 average overall and in teaching field or fields. Must be accompanied by Education 216. Either semester. 3 s.h. (E) Carbone, Cartwright, Githens, Hurlburt, Shuman, Sublett

216. Secondary Education: Internship. Supervised internship in junior or senior high schools. Full-time observation and teaching for half a semester, accompanied by Education 215. Prerequisite: 2.0 average overall and in the major or teaching field; preparation for a teaching field and/or the consent of the instructor. Either semester. 6 s.h. (E) bone, Cartwright, Githens, Hurlburt, Shuman, Sublett

Note: Education 215, 216, 118, and one other course, depending on the student's field, constitute a semester's work during the senior year.

217. The Psychological Principles of Education. An advanced study of teaching, learning, and the learner. Selected problems guiding the reading of students will be discussed in class. 3 s.h. (E) Gehman, Spaulding, Weitz

225. The Teaching of History and the Social Studies. Evaluation of the objectives, content, materials and methods in the teaching of history and

the social studies. 3 s.h. (E) Cartwright

226. Teaching Reading in the Elementary School. A study of the nature of the reading process and of principles, methods and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. Practice is provided with elementary-school children suffering reading retardation, in testing, diagnosis, and daily remedial teaching. 3 s.h. (E) Fulbright

228. Improvement of Instruction in the Social Studies. An advanced treatment of curriculum, methods, and materials in the social studies. Individuals will concentrate on subjects and grade levels of their choice.

3 s.h. (E) Cartwright

232. Supervision of Instruction. A survey of supervision as a means of improving instruction and adapting the curriculum to the learner and to

community needs. 3 s.h. (E) Hurlburt

234. Secondary-School Organization and Administration. This course is designed especially for principals, teachers, and other prospective members of the secondary-school staff. The scope of secondary education is considered to encompass junior high school, regular high school, senior high, and junior college. Special treatment is given to the problems of internal organization and management. 3 s.h. (E) Bolmeier, Nelson

235. The Nature, Function, and Reorganization of the Curriculum. Selected problems, and guiding students' reading. 3 s.h. (E)

wright, Sublett

236. Teaching Reading in the Secondary Schools. A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. For secondary-school teachers of all subjects who wish to improve the reading and study habits of their students. 3 s.h. (E) Flowers

237. Literature for Adolescents. The course offers a critical survey of literature written for, or appropriate for junior and senior high school students. Fiction, non-fiction, biography, poetry, and drama are examined. Both adult and transition-type literature are considered. Methods of organizing the program in literature are explored. 3 s.h.

239. Methods and Problems of Teaching English in Secondary Schools. This course will present sound methods of teaching the reading of literature and other forms of writing, language, grammar and composition. Materials will include selections found in widely adopted textbooks, numerous specimen themes for grading, and current books and articles

in the field. Several short compositions and a report will be required.

Bowman, Shuman

240. Educational and Occupational Information. A study of the sources of occupational and educational information: methods of securing and organizing occupational information; methods of providing vocational and educational information to students through career days, college conferences, class activities, and individual counseling; methods of making job analyses and community occupational surveys. 3 s.h. (w)

241. Principles of Guidance. An historical survey of the philosophies of guidance; a study of the interrelationships between instruction, administration, and guidance in education. Prerequisite: 6 hours of psychology

or educational psychology. 3 s.h. (w) Colver

243. Personality Dynamics. A study of personality structure and dynamics with emphasis upon the implications for counseling and instruction. Prerequisite: 6 hours of psychology or educational psychology. 3 s.h. Gehman

246. The Teaching of Mathematics. This course deals with such topics as aims, curriculum, course and lesson planning, and classroom procedure for teaching secondary-school mathematics. 3 s.h. (E)

253. School Law. The primary purpose of this course is to familiarize prospective school administrators and teachers with the legal features of school organization and administration. Although some attention is given to constitutional and statutory provisions, the main emphasis is upon court decisions relating to education. Students are expected to select appropriate problems in school law for intensive study. 3 s.h. (E)

258. Educational Measurements. A critical study of the principles and techniques involved in measurement in education with opportunity for individual research. Prerequisite: 12 semester hours in the Department, including a course in educational psychology. 3 s.h. (E) Colver, Weitz

266. Science in the Elementary School. Presentation of basic concepts in natural and physical science through selected readings, the use of simple experiments and demonstrations, construction and use of equipment, and field studies. 3 s.h. (E) Githens

276. The Teaching of High-School Science. Discussion, lectures and collateral reading related to such topics as aims, tests, curriculum, classroom and laboratory procedure, field trips, course and lesson planning for

secondary-school science. 3 s.h. (E) Githens

290. Administration of School Property. Planning and management of the school plant and its equipment to meet instructional and community needs for immediate and long-range purposes. This course is intended for teachers and principals as well as for superintendents. Areas to be treated include site selection; trends in design, lighting, ventilation and heating; custodial service and maintenance; and financing. 3 s.h. (E)

Departmental Major

Undergraduate majors in Education at Duke University are offered in elementary education and science education.

The Department offers work leading to graduation with distinction. See the section of Honors in this *Bulletin*.

Materials and Methods Courses

Certain courses concerned with materials and methods in teaching the various subjects in the public school curriculum are listed in the proper subject matter department. These courses are intended to give credit for teaching certificates and are recommended by the Department of Education for such credit.

Majors in Elementary Education and Science Education

Students desiring to teach in elementary schools or in science in secondary schools should read the descriptions of these programs of study listed under the proper headings elsewhere in this *Bulletin*.

Engineering

For courses in Civil, Electrical, and Mechanical Engineering, see page 185.

English

Professor Stevenson, Chairman; Associate Professor Ferguson, Director of Undergraduate Studies; Professor Patton, Supervisor of Freshman Instruction; Professors Blackburn, Bowman, Boyce, Budd, Duffey, Gohdes, Knight, Lievsay, Nygard, Reiss, Sanders, Smith, Turner, and Ward, Associate Professors Anderson, Bevington, Harwell, Randall, Reardon, Wetherby, and Williams; Assistant Professors Butters, Clubbe, Clum, Gerber, Jackson, Jennings, Jones, Jordan, Krueger, Mellown, Michalak, Monsman, Price, Schwerman, Strandberg, and van Kluyve; Lecturers Rottenberg and Salamon

1-2. Freshman Composition. Training in composition through the writing of weekly expository themes. The theme subjects derive from assigned reading drawn from British and American literature of the Twentieth Century. English 1 takes up the Essay, the Short Story, and the Novel;

English 2, the Play and the Poem. The student attends each week (1) a general lecture on the reading for the week; (2) a section meeting, where the instructor and a small group discuss problems of composition and literature; and (3) an individual conference in which the instructor reads and grades the weekly theme and makes special assignments according to the needs of the student. 6 s.h. (E & W) Staff

53. Advanced Grammar and Writing. Emphasis is placed first on the student's mastering the fundamental principles of English grammar and

the other essentials of correct writing. 3 s.h. (E) Jordan

65-66. Imaginative Writing. A foundation course in imaginative writing, both prose and verse. Primarily for sophomores, but in special cases open to students from other classes. The consent of the instructor is required.

quired. 6 s.h. (E) Sanders

93. Technical Communication. Emphasis will be placed on the writing of business letters, technical reports, and articles for submission to technical journals. Approximately one-third of the course will provide training in the oral presentation of various materials. Primarily for students in Engineering. Prerequisite: English 1 and 2. 3 s.h. (w) Harwell and Staff

whom English for Foreign Students. Designed to assist the student to whom English is a second language to perfect his speaking and understanding of the language. Drills in writing, speaking, listening, and the American idiom. Open to all students and their wives, and to any persons and spouses with an official connection with the University. Those who do not pay full-time student fees may register for a fee of \$5.00. No credit.

(w) Wetherby

101. Advanced Expository Writing. Designed for students interested in expository writing, this is a course in advanced composition. Primarily for juniors and seniors; open also to sophomores approved by the instructor.

3 s.h. (E) Jennings

103-104. Narrative Writing. Class discussion of students' manuscripts, supplemented by a critical evaluation of selected short stories and a novel and by individual conferences with the instructor. Open to sophomores, juniors, and seniors. Students desiring admission to the course should present a piece of writing to the instructor as early as possible in the spring semester. Prerequisite for English 104: English 103. 6 s.h. (E) Blackburn

Speech and Drama

51. Essentials of Public Speaking. A basic course in public speaking, designed to give the student the poise and confidence necessary to think and speak freely before an audience. Particular attention is paid to the gathering and organization of speech materials and to oral presentation.

Not open ordinarily to juniors and seniors. 3 s.h. (w) Michalak, Reardon, and Schwerman

118. Persuasive Speaking. The psychological and sociological techniques used in gaining acceptance of ideas through speech. Study is made of the factors influencing human behavior; audience analysis and motivation; choice, arrangement, and adaptation of material. Extensive practice in persuasive speaking. Prerequisite: English 51 or 151 or consent of the instructor. 3 s.h. (w) Wetherby

119. History of the Theater. The origin and development of drama, acting, and stagecraft from ancient Greece to the modern European and American theater. Production problems of representative plays of the various periods will be discussed. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (w)

121. Stagecraft. An introductory course on the technical aspects of play production: scenery, lighting, properties, make-up, and costuming. Laboratory work will be coordinated with the various productions of the Duke Players. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (E) Michalak

122. Play Production. An introduction to the methods of producing a play; theater organization, play selection, casting, and rehearsal. Lectures and laboratory. Primarily for juniors and seniors; open also to sophomores

approved by the instructor. 3 s.h. (E) Michalak

139. The Speaking Voice. A study of the mechanisms of speech. Emphasis is placed on providing the skills necessary for the improvement of voice, pronunciation, and diction. Methods of correcting minor functional speech disorders will also be studied. 3 s.h. (w) Wetherby

150. Oral Interpretation of Literature. A study of poetry and certain types of prose, with practice in the technique by which they may be com-

municated to an audience. 3 s.h. (w) Schwerman

151. Essentials of Public Speaking. A basic course in public speaking for juniors and seniors dealing with the same matters as 51. (Not open for credit to students who have taken 51.) 3 s.h. (E & W) Michalak, Reardon, and Schwerman

- 152. Argumentation. The principles of argumentation and debating. The techniques of analysis, investigation, evidence, reasoning, brief making, and refutation. Participation in class discussions and debates. Prerequisite: English 51 or 151 or consent of the instructor. 3 s.h. (w) Wetherby
- 171, 172. Broadcasting. A study of the background of radio and television broadcasting. The first semester covers the development of broadcasting as an industry and as a literary form. The second semester studies the legal and social aspects, and the various program forms. 6 s.h. (w) Wetherby

English and American Literature and Language

55, 56. Representative British Writers. The following works are studied in the first semester: Chaucer's Prologue to The Canterbury Tales and at least two tales, Shakespeare's I Henry IV, Hamlet or King Lear, and one other play, John Donne's poetry (selections), Milton's Paradise Lost (selections) and some of the shorter poems; in the second semester: novels by Fielding (Joseph Andrews) and Dickens (Great Expectations), and selections from the poetry of Pope, Wordsworth, Keats, and Yeats. 6 s.h. (E & W) Staff

57, 58. Representative American Writers. Selections and complete works. The first semester includes Poe, Emerson or Thoreau, Hawthorne, Melville, Whitman, Dickinson, and Twain; the second includes James, Frost or Robinson, Crane or Dreiser, O'Neill, Faulkner, Heming-

way, and others. 6 s.h. (E & W) Staff

111,112. Eighteenth-Century Literature. The writers emphasized in the first semester are Pope, Swift, Defoe, Addison, Steele, and Fielding; in the second semester, Johnson, Gray, Boswell, Goldsmith, Sheridan, the later novelists, and Blake. 6 s.h. (E) Ferguson

117. Milton. Milton's poetry and prose, together with their relation to the period and to other great works of literature. 3 s.h. (E) Lievsay and Price

123, 124. Shakespeare. In the first semester twelve plays, before 1600; in the second semester about ten plays, after 1600. 6 s.h. (E & W) Bow-

man, Krueger, Randall, and Williams

125, 126. English Literature, 1789-1832. The course begins with selections from the poetry of the forerunners of Romanticism. The chief emphasis in the first semester is on the work of the older Romantics: Wordsworth, Coleridge, Lamb, and Hazlitt. In the second semester the chief emphasis is on the work of the younger Romantics: Byron, Shelley, Keats, and DeQuincey. 6 s.h. (w) Patton

127. The English Novel From The Beginnings to 1800. Some of the writers studied are Nashe, Deloney, Lyly, Sidney, Bunyan, Behn, Defoe, Pickendson, Fickling, Smallett, and Shangan, ask (7). Regulation

Richardson, Fielding, Smollett, and Sterne. 3 s.h. (E) Randall

128. The English Novel in the Nineteenth Century. Some of the writers studied are Scott, Austen, Dickens, Thackeray, Trollope, the Brontës, George Eliot, Meredith, Butler, and Hardy. 3 s.h. (E) Ferguson and Stevenson

129. The English Novel in the Twentieth Century. Some of the writers studied are Conrad, Lawrence, Forster, Joyce, Woolf, Huxley, Cary, Amis, and Golding. 3 s.h. (E) Mellown and Smith

131, 132. English Literature, 1832-1900. A study of the major writers of poetry and prose from Macaulay to Hardy. The authors studied in the first semester are Macaulay, Tennyson, Carlyle, the Brownings, Newman,

Mill, Clough, and FitzGerald; in the second semester, Arnold, the Rossettis, Ruskin, Patmore, Meredith, Huxley, Morris, Swinburne, Pater, and Hardy. Collateral reading from novels of the period. 6 s.h. (E) *Harwell*

133, 134. Twentieth-Century Poetry. A study of twentieth-century poetry and criticism of poetry in England and America. Problems in critical analysis and interpretation. First semester: the emphasis is on sources in nineteenth-century Symbolism and on the poetry of Hopkins, Yeats, Eliot, Pound, and Stevens. Second semester: the emphasis is on the poets and the poetic theories of the last thirty years. 6 s.h. (E) Bevington

137, 138. American Literature. A survey from colonial times to the present. Selections and complete novels by Hawthorne and Melville in the first semester; Twain, Henry James, Howells, and others in the second. (Not open for credit to students who have taken a matching semester of 57, 58.) 6 s.h. (E & W) Anderson, Budd, Duffey, Gerber, and Jones

141. Chaucer. The Canterbury Tales and the minor poems, with attention to their literary and social background. 3 s.h. (E) van Kluyve

142. English Literature of the Middle Ages. A study of the principal forms and examples of English prose, poetry, and drama of the Anglo-Saxon and Middle English periods (excluding Chaucer), read in translation. 3 s.h. (E) van Kluyve

143, 144. English Literature: Elizabethan and Seventeenth Century. A study of the poetry, prose, and drama of the period. First semester: the emphasis in poetry is on Wyatt, Sidney, Spenser, Raleigh, Shakespeare; in prose, on Sidney and Florio's Montaigne; in drama, on Marlowe. Second semester: the chief emphasis is on the metaphysical poets—Donne through Vaughan. Prose: Bacon, Burton, Donne, Browne. Drama: Jonson, Webster, Ford. 6 s.h. (E) Blackburn

147. The Literary Expression of Scientific Thought. Readings which delineate man's changing concept of nature, with emphasis on both the scientific thought and the literary merit of each text. Representative works of Hesiod, Plato, Aristotle, Lucretius, Descartes, Thomas Browne, Bertrand Russell, and others. 3 s.h. (w)

148. Satire. An exploration of the nature and art of literary satire, based on examples, mostly English and American, of various forms and kinds; character-sketch, dialogue of the dead, fable, verse-narrative, eulogy, drama, novel, etc. Prerequisite: English 55, 56. s.h. (E) Boyce

150. Oral Interpretation of Literature. See under "Speech and Drama."

153, 154. Readings in European Literature. Significant works are read in translation and related to similar works in English literature. The first semester includes selected writings of Homer, the Greek dramatists, Plato, Virgil, and Ovid. The second semester comprises works by Dante, More,

Cervantes, Molière, Voltaire, Goethe, Dostoevski, Ibsen, and Kafka. 6 s.h. (w) Krueger

155. Modern European Drama. Continental and Irish plays from Ibsen to Brecht are read in relation to the modern drama of ideas and to the free theater movement. 3 s.h. (E) Reardon

156. Modern English and American Drama. Plays from Pinero to Arthur Miller are read and discussed in relation to European origins and

to the contemporary scene. 3 s.h. (E) Reardon

159. Readings in Scandinavian Literature. A study of selections in translation from Ibsen, Strindberg, Lagerkvist, and others; their place in the literary tradition of Scandinavia and their relationships with English and American literature. 3 s.h. (w) Anderson

161. Development of the English Language. An elementary historical study of the English language: patterns of change and growth, with some attention to methods of philological inquiry and the relations of philology

to literary studies. 3 s.h. (E)

162. Modern English Grammar. A descriptive study of written and spoken American English of the present time, with attention to standards of usage and pronunciation and the relations of grammar to composition. 3 s.h. (E)

165, 166. American Fiction. A survey of the novel and the short story. The first semester covers the nineteenth century, from Washington Irving to Stephen Crane; the second covers the twentieth century through ten

representative books. 6 s.h. (w) Anderson and Budd

167, 168. The European Epic Tradition. The development of the Epic tradition seen through detailed analysis of the major texts and major themes: Homer, Vergil, Beowulf, Dante, Cervantes, Milton, Tolstoy, Joyce. Prerequisite for 168: 167. 6 s.h. (w) (Not offered in 1967-68.) Knight

181. Conference on Drama. A seminar primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing,

with intensive study of one or more authors. 3-6 s.h. (E)

182. Conference on Poetry. A seminar primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing, with intensive study of one or more authors. 3-6 s.h. (E)

183. Conference on Fiction. A seminar primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing,

with intensive study of one or more authors. 3-6 s.h. (E)

184. Conference on Prose Non-Fiction or a Special Topic. A seminar primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing, with intensive study of one or more authors. 3-6 s.h. (E)

185. The Agrarian Spirit. An interdisciplinary analysis of American history and literature, combining two ways of understanding the response

to the wilderness, pre-urban individualism, agrarian democracy, and the modern reaction against industrialism. (Same as History 185.) 3 s.h.

(w) (Not offered in 1967-68.) Budd and Scott

186. The Industrial Spirit. An interdisciplinary analysis of American history and literature combining two ways of understanding the rise of the city, modern industry, science and technology, corporate thinking, and the mass media. (Same as History 186.) 3 s.h. (w) (Not offered in 1967-68.) Budd and Scott

191, 192. Independent Study. Directed reading and research. Open only to highly qualified students by permission of the Department. See p.

56. 6 s.h.

197-198. Senior Seminar in English. A course designed to offer guidance in the analysis and interpretation of English and American literature to students of superior ability. Comparative studies will be encouraged, and considerable reading will be required in critical and aesthetic theory. Emphasis will be placed upon the final essay. Admission by invitation of the Department. 6 s.h. (E & W) Jones and Krueger

For Seniors and Graduates

203. Chaucer. The minor poems, Troilus, and The Canterbury Tales. 3 s.h. (w) Nygard and Reiss

207. Old English Grammar and Readings. 3 s.h. (w) Nygard and

Reiss

208. History of the English Language. A survey of the language from Old to Present English, taking into consideration developments in phonology, morphology, syntax, and vocabulary. 3 s.h. (w) Nygard and Reiss

209. Present-Day English. A description of present-day American English from the point of view of modern linguistic theory; comparison of traditional and structural grammars; semantic change; the relation of the written to the spoken language; usage. 3 s.h. (w) Nygard and Reiss

213. Introduction to Folklore. A survey of the materials of popular tradition, the folksong, the folktale, the proverb, the riddle, and other forms; the methods of folklore investigation; and the relation of these

popular genres to literary tradition. 3 s.h. (w) Nygard

215, 216. Elizabethan Drama. Study of one or two major dramatists (Jonson or Beaumont and Fletcher) and extensive reading in other writers (Heywood, Ford, Massinger, Marlowe, Middleton) with emphasis on the nature and qualities of their work in relation to its historical background. 6 s.h. (w) Lievsay and Randall

217. Milton. Milton's poetry and prose, with emphasis on the major

poems. 3 s.h. (w) Lievsay

218. Spenser. The reading of Spenser's works, with chief attention to

The Faerie Queene. 3 s.h. (w)

219, 220. The Eighteenth Century. Swift, Pope, Defoe, Addison, Steele, and others are studied in the first semester; in the second, Gray, Johnson, Boswell, Collins, Goldsmith, the novelists and other writers. 6 s.h. (w) Boyce and Ferguson

221, 222. English Literature of the Early Nineteenth Century. The Romantic poets and prose writers from Scott to the early Carlyle, with special attention to Wordsworth, Coleridge, and Keats. 6 s.h. (w)

Patton, Sanders, and Stevenson

- 223, 224. English Literature of the Later Nineteenth Century. The first semester is devoted chiefly to Carlyle, Dickens, Thackeray, Tennyson, and Browning; the second semester to Arnold, Ruskin, Pater, George Eliot, Meredith, the Pre-Raphaelites, and Swinburne. 6 s.h. (w) Sanders and Stevenson
- **227.** Literary Criticism. Readings from the major critics, Plato to the present, with emphasis on formative ideas and historical continuity. 3 s.h. (w) Lievsay

229, 230. American Literature, 1800-1865. The writers emphasized in the first semester are Emerson, Thoreau, and Hawthorne; in the second semester, Poe and Melville. 6 s.h. (w) Budd and Turner

233, 234. American Literature, 1865-1920. Selected works of representative authors of the period. The first semester's assignments will include Whitman, Lanier, Mark Twain, James, Howells, Emily Dickinson, Henry Adams, and the Local Colorists; the second semester's Crane, Norris, Moody, London, Dreiser, Edith Wharton, Willa Cather, O'Neill, Robinson, and Frost. The lectures will deal primarily with literary trends as

shaped by the social background. 6 s.h. (w) Goldes

235, 236. American Literature Since 1920. First semester, selected fiction Gertrude Stein to the present. Second semester, poetry from the

Imagist movement to the present. 6 s.h. (w) Duffey

237. English Drama, 1642-1800. The heroic play and the comedy of manners of the Restoration; the important plays, serious and comic, of the eighteenth century. 3 s.h. (w) Ward

239. Shakespeare. The plays and poems. 3 s.h. (w) Williams

- 244. Literary Biography. Selected works from Plutarch to Strachey with discussion of the historical development of biography, the various methods it has used, and the various theories which have been held about it. 3 s.h. (w) Sanders
- 251, 252. English Literature in the Seventeenth Century. Major works in prose, poetry, and drama from 1600 to the death of Dryden. 6 s.h. (w) Randall and Ward
- 261, 262. English Literature of the Twentieth Century. Representative work of leading writers from 1900 to 1950, in fiction, drama, and poetry.

The first semester will include Shaw, Conrad, Yeats, Wells, Bennett, Galsworthy, Ford, Synge, Forster, and Lawrence; the second semester, Joyce, Woolf, Edith Sitwell, Eliot, Huxley, Graves, Bowen, Auden, and Dylan Thomas. Critical analysis of selected texts, with discussion of techniques and ideas. 6 s.h. (w) Smith

264. Major Developments in Contemporary American Poetry. The principal contributions to modern poetry made by American poets, including imagism and the new poetry; Eliot, Stevens, Hart Crane, the "Fugitives," and a selection from the poets of the present generation. 3 s.h.

 (\mathbf{w})

266. Recent Critical Thought. Questions of the nature and value of literature as reflected in recent criticism, theoretical and practical. 3 s.h.

Duffey

269, 270. Southern Literature. The principal authors and the chief literary developments from the beginnings to the present. Emphasis in the first semester is on Byrd, Kennedy, Simms, Poe, Timrod, and the humorists; in the second on Lanier, Harris, Cable, Mark Twain, Ellen Glasgow, and Faulkner. Attention is given to the historical and cultural background and to literary relations extending outside the region. 6 s.h. (w) Turner

277. English Prose of the Sixteenth Century. Readings in the major

forms and authors. 3 s.h. (w) Lievsay

278. English Non-Dramatic Poetry of the Sixteenth Century. Extensive select readings from representative types and authors, excluding Spenser. 3 s.h. (w) Lievsay

Departmental Major

Prerequisite. English 55-56.

Major Requirements. Twenty-four semester hours above the sophomore level in writing, speech, drama, literature, and language; at least eighteen hours must be in English and American literature meeting the following requirements of distribution:

- 1. Six hours at the junior-senior level (generally to be taken in the junior year) in one of five designated period courses (143-144, 111-112, 125-126, 131-132, 137-138).
- 2. Three hours in one of the major authors: Chaucer, Shakespeare, or Milton (141, 203, 123, 124, 239, 117, 217).
- 3. The remaining hours must meet the following distribution requirements:
 - (a) Three hours of English literature before 1800 (excluding major authors), unless the requirement is met in (1) above.
 - (b) Three hours of English literature after 1800, unless the requirement is met in (1) above.

(c) Three hours of American literature, unless the requirement is met in (1) above.

Related Work. Eighteen semester hours, which may include appropriate courses in history, aesthetics, art, music, foreign languages and literature, literature in translation, philosophy, religion, linguistics, and the teaching of English. Related work must be taken in at least two departments.

The Department offers work leading to graduation with distinction. See

the section on Honors in this Bulletin.

Forestry

Students without a Bachelor's degree who are preparing for work in forestry as a profession should take the courses outlined under the Academic-Forestry Combination outlined in the section on Requirements for Degrees. However, with the consent of the instructor in charge, certain forestry courses may be elected by students in other curricula provided they have had adequate preparation (see *Bulletin of the School of Forestry*).

Members of the sophomore, junior, and senior classes, whether or not registered in the Forestry Combination Program, may elect the following

course:

52. Principles of Forestry. Introduction to forestry in the United States; growth of trees and forests; social and economic problems in developing America's primary renewable natural resource; contribution of forests to the national economy. 2 s.h. (w) White

French

For courses offered in French, see Romance Languages, p. 164.

Geology

Associate Professor Heron, Acting Chairman; Associate Professor Furbish, Director of Undergraduate Studies; and Assistant Professors Lynts and Pilkey

1. Geology. This course is designed to give a general view of the surface features of the earth, their origin, structure and materials. Illustrative materials are studied in the laboratory. Excursions are made to neighboring points where the principles of the science are studied in the

field. Three one-hour lectures or recitations and one three-hour labora-

tory. 4 s.h. (E) Heron and Staff

2. Geology. This course is designed to give some knowledge of the chief events of the earth's history. Excursions will be made to suitable neighboring localities. Three one-hour lectures or recitations and one three-hour laboratory. Prerequisite: Geology 1. 4 s.h. (E) Heron and Staff

53. Introductory Oceanography. Basic principles of physical chemical, biological and geological oceanography. (Also listed as Botany 53.) Prerequisite: One year laboratory science or concurrent enrollment in a

laboratory seience. 3 s.h. (E) Pilkey and Searles

101. Crystallographic Mineralogy. Definition of the crystalline state, lattice and group concepts, indices, crystal systems, classification and crystal morphology. Lectures and laboratory. 3 s.h. (E) Furbish

102. Fundamentals of Mineralogy. Crystal chemistry, crystal physies, mineral identification and genesis. Lectures or recitations, laboratory, field trips. Prerequisite: Chemistry 2 (may be taken concurrently) and Geology 101. 3 s.h. (E) Furbish

106. Igneous and Metamorphic Rocks. Silicate mineralogy, theory of origin and elassification of igneous and metamorphic rocks and rock identification. Lectures and laboratory. Prerequisite: Geology 102. 3 s.h.

(E) Furbish

- 108. Sedimentary Rocks. Authigenie and detrital minerals, theory of origin and classification of sedimentary rocks and rock identification. Lecture, laboratory and field trips. Prerequisite: Geology 1. 2 s.h. (E) Heron
- 143. Principles of Stratigraphy. Theory of eorrelation, sedimentation and stratigraphic units. Leetures and field trips. Prerequisite: Geology 2. 3 s.h. (E) Staff

151. Economic Geology. Study of world distribution, geologie oeeurrenee and uses of important mineral deposits. Three one-hour lectures or

recitations. Prerequisite: Geology 102. 3 s.h. (E) Furbish

164. Introduction to Geologic Field Methods. Principles and techniques used in geologic mapping and field studies including applicable methods of surveying and the use of aerial photographs. Lectures, laboratory and field trips. Prerequisites: Geology 1 and 2. 3 s.h. (E) Furbish

166. Structure. Structural features of the earth's crust. Prerequisites.

Geology 106, 143. 3 s.h. (E) Furbish

175, 176. Majors Seminar. Review of current literature in selected fields of geology. Required of all majors; 175 in the spring of the Junior year; 176 in the spring of the Senior year. One hour per week. 1 s.h. (E) Staff

191, 192. Independent Study. Directed reading and research. Open

only to highly qualified students in the junior and senior years, by permission of the Director of Undergraduate Studies. (See page 55.) 6 s.h. Staff

For Seniors and Graduates

203. Advanced Stratigraphy. A survey of the Phanerozoic deposits of the world with special emphasis on type areas. 3 s.h. (E) Staff

205. Geological Oceanography. The study of the broad geologic aspects of the ocean basins, including origin, bottom physiography, sediment distribution and sedimentary processes. Observations in the field will be emphasized and will include training in sampling procedures for both shallow and deep water. This course is not open to students who have completed Geology 206. 6 s.h. *Pilkey* (Given at Beaufort only.)

206. Principles of Geological Oceanography. A survey of geological aspects of the oceans including sediment types, processes of sedimentation, geologic structures of the ocean basins, and bottom physiography. Prerequisite: Geology 207 or consent of the instructor. 3 s.h. (E)

Pilkey

207. Sedimentary Petrography. Systematic description and classification of sedimentary rocks. 3 s.h. Heron

222. Sedimentary Minerals. Major detrital and authigenic minerals with

emphasis on the clay minerals. 3 s.h. (E) Heron

235. Sedimentary Geochemistry. A survey course of the broader aspects of marine geochemistry and the geochemistry of ancient and recent sediments. Also included is a review and general summary of inorganic chemical principles important to the control of geochemical processes. 3 s.h. (E) Pilkey

241-242. Invertebrate Paleontology. Biologic and stratigraphic relationships of fossil invertebrates, with special emphasis on evolutionary trends of invertebrates as interpreted from fossil evidence. Lectures, and laboratory. Prerequisites: Geology 1, 2, or consent of instructor. 6 s.h.

Given biennially. (E) Lynts

243-244. Micropaleontology. Microscopic animal and plant fossils, exclusive of spores and pollen, with special emphasis on their biology, taxonomy, evolution and stratigraphic distribution. Two one-hour lectures or recitations and one three-hour laboratory. Prerequisites: Geology 241-242, or consent of instructor. 6 s.h. Given biennially. (E) Lynts

247. Paleoecology. Application of ecologic and geologic principles to the reconstruction of the interrelationship between organisms and their environment in geologic time. Prerequisites: Geology 207, 242, or consent of instructor. 3 s.h. Given biennially. (E) Lynts

251. Geomathematics. Application of quantitative techniques, including geometrics, to the characterization and solution of geologic problems.

Prerequisites: Geology 1, 2 and Mathematics 22, or consent of instructor. 3 s.h. Given biennially. (E) Lynts

Departmental Major

Prerequisites. Chemistry 1, 2, Geology 1 and 2.

Major Requirements. A.B. degree, a minimum of 24 hours of geology above the elementary courses (1, 2). B.S. degree, a minimum of 24 hours of geology above the elementary courses (1, 2) plus an approved summer field course normally taken during the summer of the junior year.

Related Work. Number of hours needed for A.B., 12 s.h.; for B.S., 18 s.h. Required courses, Mathematics 21, 22. Departments in which related work is usually taken, chemistry, mathematics, physics, zoology, and engineering.

Germanic Languages and Literature

Professor Salinger, Chairman; Associate Professor Seymour, Director of Undergraduate Studies; Supervisor of Freshman Instruction, Lecturer Mrs. Bessent; Professor Phelps; Associate Professor Maxwell; Assistant Professors Best and Salamon; Visiting Lecturers Arnoldner and Gaertner; Instructors Arndt, Klabes, and McClung

1-2. Elementary German. Practice in understanding, speaking, reading, and writing. Classroom techniques are combined with those of the language laboratory. 8 s.h. (E & W) Bessent and Staff

63-64. Intermediate German. Prerequisite: German 1-2 or equivalent.

6 s.h. (E & W) Phelps and Staff

German 63-64 is prerequisite for 91, 92 and all 100 group courses.

91, 92. Introduction to German Literature. A third-year course, completing the language requirement. Reading from representative German authors. 4 s.h. Arndt, Arnoldner, Bessent, and Best

107, 108. Scientific German. The German language as used in the vari-

ous contemporary sciences. 4 s.h. Best

109, 110. German Prose Fiction. Origin and development of the German novel and short story with special emphasis on the nineteenth century. 4 s.h. Gaertner and Phelps

115, 116. German Drama of the Nineteenth Century. A study of lead-

ing dramatists from Kleist to Hauptmann. 4 s.h. Best

117, 118. German Conversation. A course in writing and speaking German, restricted to German majors and other students by permission of the Department. 6 s.h. Salamon

119, 120. Survey of German Literature. German literature and its cul-

tural background. First semester: From the beginnings to the romantic period. Second semester: From romanticism to the present. Lectures, reports, and readings. 6 s.h. *Best and Phelps*

125, 126. Contemporary German Literature. A study of representative

works of the twentieth century. 4 s.h. Salamon

131, 132. Introduction to Goethe. The reading of his early novels, dramas, and epics and works pertaining to his life. 4 s.h. Salinger

133, 134. The German Lyric. A survey of the development of German lyric poetry, principally from Klopstock to Rilke (with some attention to mediaeval and early modern poets), seen as poetic reflection of German thought. 6 s.h. Salinger

171, 172. German Literature in English Translation. The great epochs in German Literature studied through English translations of representa-

tive masterpieces. 6 s.h.

191, 192. Independent Study. Directed reading and research. Open only to qualified students in the junior year, by permission of the Depart-

ment. See p. 56. 6 s.h. Phelps, Salinger, and Seymour

193, 194. Independent Study. Directed reading and research. Open only to qualified students in the senior year, by permission of the Department. 6 s.h. Phelps, Salinger, and Seymour

201, 202. Goethe. A study of his life and works in the light of his lasting significance to German and world literature. 6 s.h. *Phelps and Salinger*

203, 204. Eighteenth Century. Eighteenth-century German literature in its relation to contemporary European philosophy. 6 s.h. *Phelps*

205, 206. Middle High German. The language and literature of Ger-

many's first classical period. 6 s.h. Arnoldner and Seymour

207, 208. German Romanticism. The course covers the entire field of German romanticism from 1800. 6 s.h. Arnoldner

- 209, 210. Kleist, Grillparzer, and Hebbel. The development of the drama in Germany and Austria between Schiller and Naturalism. 6 s.h. Salinger
- 211, 212. Heinrich Heine and His Time. Heine's life and thought, and the contemporary European culture. 6 s.h. Salinger
- 213. Nineteenth-Century Literature. From the end of Romanticism through Realism. Readings from Mörike, Büchner, Hebbel, Stifter, Keller, Meyer, Storm, and Fontane. 3 s.h.
- 214. The Twentieth Century. Literature of the twentieth century, as seen through representative authors. 3 s.h.

215. Seventeenth-Century Literature. A study of the leading writers of

the Baroque, seen against the background of their time. 3 s.h.

216. History of the German Language. The development of the phonology, morphology and syntax of German from earliest beginnings to the present. 3 s.h. Seymour

217. Renaissance and Reformation Literature. The period from 1400

to about 1600. 3 s.h. Best

218. The Teaching of German. Critical survey of modern teaching techniques; intensive practice in solving problems encountered in the teaching of German on the secondary and college levels. Analysis and evaluation of textbooks and related audio-visual materials with special emphasis on the utilization of the language laboratory. 3 s.h. *Phelps*

230. German Cultural History. A study of the backgrounds of German civilization and culture (Kulturkunde) in varying aspects and impacts

from earliest times down to the most recent. 3 s.h.

Departmental Major

Prerequisites. German 1-2 and 63-64, or equivalent.

Major Requirements. Twenty-four semester hours in the German Department. Nine of these must be selected from the 200 courses. The remaining fifteen may be selected from any courses in the 100 or 200 groups. German 107, 108 does not count toward the major. German 117, 118, and 119, 120 (as well as Linguistics 101) are highly recommended to any student majoring in the Department.

Related Work. Eighteen semester hours, chosen from the Humanities

with the approval of the Germanic Languages Department.

Greek

For courses in Greek, see Classical Studies.

Health and Physical Education

Trinity College and the School of Engineering

Mr. Cameron, *Director*; Professor Friedrich, *Chairman of Physical Education and Assistant Director of Physical Education*; Professor Falcone; Associate Professors Bly, Cox, and Persons; Assistant Professors Buehler, Corrie, Davis, Hall, LeBar, Skinner; Instructors Einstein, Hagler, Harvey, and Daly

Required Physical Education for Men

A student must complete four semesters of physical education to fulfill graduation requirements. For each semester of undergraduate enrollment, the student is issued a uniform appropriate for the season and the

activity in which he is engaging. The uniform is issued, exchanged, laundered, and maintained at no additional expense to the student. Equipment for courses is also furnished. Students who cannot swim are required to learn how during the Freshman year.

All students are given a medical and physical examination before registration. Freshmen who have physical handicaps must register in Adapted Physical Education—P.E. 11 and P.E. 12. Sophomores in P.E. 61 and 62. Students assigned to these classes will take work adapted to their particular needs and capacities.

Physical Education 1. Students not assigned to adapted physical education will register in P.E. 1—Foundations of Physical Education. The fall program for freshmen has been specifically designed to provide the student with a broader concept of the "how" and "why" of physical activity. It includes an extensive battery of tests and involves information and activities related to interpretations of health and fitness, training techniques, relaxation techniques, weight control, body mechanics and posture control. Students are given an opportunity to improve their level of fitness and become acquainted with various sports activities, through a special orientation program.

On the basis of the test results and other factors such as body type, students are guided into those areas which can best help them develop their physical potential and provide for their present and future needs. During the second semester students are enrolled in those activities best

During the second semester students are enrolled in those activities best suited for them. These activities include most of the courses offered as well as Combatives, Gymnastics, Swimming, Track and Field, and Individual Development.

After a student has completed Freshman Physical Education, he may fulfill his physical education requirement by electing and satisfactorily completing two courses from the following individual, dual, and team sports: P.E. 36—Beginning and Intermediate Swimming; P.E. 46—Swimming and Life Saving; P.E. 51—Tumbling, Rebound Tumbling and Apparatus; P.E. 52—Badminton-Handball; P.E. 53—Basketball-Speedball; P.E. 54—Combatives and Track and Field; P.E. 55—Soccer-Lacrosse; P.E. 56—Advanced Swimming and Water Safety; P.E. 57—Tennis-Volleyball; P.E. 58—Golf (A fee of \$10.00 for the semester, payable at the Treasurer's Office, is charged for course 58—Golf); P.E. 61 and 62—Sophomore adapted P.E. is offered for those students who are assigned to this course by the health center. P.E. 63—Individual Development. (This course which is open to all students includes conditioning, posture, weight control, fundamental movements, and weight training.) P.E. 64—Fencing. P.E. 70—Bowling and Square Dancing. (Fee required)

Elective Professional Physical Education Courses (Men)

The courses listed below are arranged to meet the increasing demand for teachers who are qualified to coach and teach Physical Education as well as for those who may have leadership responsibilities in the area of recreation. These courses are open as electives for students in High School Teaching Programs and others for whom such courses may be appropriate. Teaching majors may elect 18 semester hours from courses in this group. Six semester hours may be elected from the courses listed under Special Methods in Physical Education, 9 semester hours from the courses listed under Theory and Practice in Physical Education, and 3 semester hours from Health Education. The courses must be selected with the prior approval of the Director of Undergraduate Studies from the student's major department, in order to meet the needs of the individual.

Special Methods in Physical Education

163. Athletic Coaching in Secondary Schools. Theory and practice in the fundamentals of coaching baseball and track. Prerequisites: courses 1 and 2. Open to juniors and seniors. Sophomores by permission only. 3 s.h. (w) Buehler and Parker

164. Athletic Coaching in Secondary Schools. Theory and practice in the fundamentals of coaching football and basketball. Prerequisites: courses 1 and 2. Open to juniors and seniors. Sophomores by permission only. 3 s.h. (w) Falcone and Daly

Theory and Practice in Physical Education

65. History and Principles of Physical Education. Investigation of the objectives and scientific principles upon which physical education is based. The history of physical education is studied in order to show the changes in objectives, principles, and methods and as an aid in the interpretation of trends. Open to sophomores, juniors, and seniors. 3 s.h. (w) Friedrich

66. Recreational Leadership. Theories and philosophies of play and recreation with emphasis on leadership and application to community organizations, school and family situations. 3 s.h. (w) Friedrich

182. The Administration of Physical Education and Athletics in Secondary Schools. A case study appraisal of athletic health and physical education problems experienced in the organization and administration of athletics health and physical education. 3 s.h. (w) Corrie

190. Protective Practices in Physical Education. A study of safety un-

protective measures, including training and first aid. Open to juniors and seniors. 3 s.h. (w) Davis

Health Education

132. School Health Problems. A course designed (a) to familiarize the teacher with school health problems such as physical screening, communicable disease prevention and control, healthful school environment; (b) to present methods and materials for health teaching in elementary and secondary schools. 3 s.h. (w) Friedrich

Health and Physical Education

Woman's College

Professor McCue, Chairman; Professor Lewis, Director of Undergraduate Studies; Associate Professor Eddy, Supervisor of Freshman Instruction; Professor Bookhout; Associate Professors Holton and Uhrhane; Assistant Professors Lloyd, Spangler, Woodyard, and Wray; Instructor Raynor

Required Physical Education for Women

A student must complete four semester hours of physical education in order to fulfill graduation requirements. Ordinarily work must be completed by the end of the sophomore year. Classes meet three times a week or the equivalent thereof. Gym suit, dance leotard, bathing suit, warm-up suit, and towel are provided and laundered as needed.

Each semester is divided into halves. In general, indoor activities are taught during the two winter half-semesters and outdoor activities in the

fall and spring.

Every student must take one course (half-semester) in dance and one in swimming if she is unable to pass the swimming test. The remaining work necessary to complete the requirement may be elected from the activities listed in this section.

All students are given a physical examination upon entering and at any other time when deemed necessary. Classes in adapted physical education and recreational sports are arranged for those who should not take the more active work.

Special Freshman Physical Education

At the beginning of the year, after a series of tests has been given, each freshman is registered for the course she most needs, as determined by

the test scores. Courses in sports fundamentals, beginning swimming, and posture and movement are offered for those who need to improve their skills in these areas. Students whose test scores are satisfactory may enroll in activity classes with the sophomores.

Physical Education Activities

Individual and dual sports: archery, badminton, bowling, diving, fencing, first aid, golf, gymnastics, life saving, recreational sports, riding, swimming, tennis, track and field, and water safety.

Team sports: basketball, hockey, "rec" ball, softball, speedball, and

volleyball.

Dance: folk dance, modern dance, square dance, and tap dance.

Developmental Activities: conditioning exercises, posture, posture and movement, and sports fundamentals.

1-2. Freshman Activity. Any of the special or elective activities

described above. 2 s.h. Staff

51-52. Sophomore Activity. Any of the special or elective activities described above. To repeat an activity, one advances to the next skill level, i.e., beginning tennis, then intermediate tennis. 2 s.h. Staff

Theory in Physical Education

The courses listed in this section are open for credit as follows: P.E. 91, 101, 117, 119, 120, 181-182, and 185, Health Education 101-102 are open to students majoring in physical education and health; P.E. 91 is also open to students in the Elementary Teaching Program. Physical Education 105, 106, 113, 114, and 130 and Health Education 134, 137, 138, and 140 are open to all undergraduates, both men and women.

91. First Aid and Safety in Physical Education. A study of measures which must be taken to insure maximum safety in physical education programs; principles and practices in the care and prevention of athletic

injuries. 1 s.h. (E) Lloyd

101. History and Principles of Physical Education. A survey of the relationship between physical education and social, political, and religious ideals of different nations and periods. Principles upon which physical education is based. A study of the physical, emotional, and social development of children at different ages with implications for physical education. Analysis of successful teaching. 3 s.h. (E) McCue

102. The Teaching of Physical Education in Elementary Schools. A study of methods and materials for teaching physical education to children. Discussion of principles of physical education and practice in teaching elementary school activities. Required of students in the ele-

mentary school teaching program. 2 s.h. (E) Lewis

105, 106. Methods and Materials in Recreation. A course to develop leadership in recreational activities. Recommended for students interested in camping, scouting, Peace Corps and Operation Breakthrough. Laboratory work includes experience with a recreational group in a city organization. Areas covered: games, social activities, folk and square dancing, crafts, drama, song leading and story telling. Open to sophomores, juniors, and seniors. 3 s.h. each (E) Holton

113. Mammalian Anatomy. A study of all organ systems with special emphasis on osteology, arthrology and myology. The cat is used as laboratory animal, but constant application is made to man. Not open to students who have had Zoology 53. Prerequisite: Biology 1 and 2. 4 s.h.

(E) Bookhout

114. Kinesiology. A study of muscle function. Analysis of fundamental movements with emphasis on the development of normal posture and efficient body movement. Required of students majoring in physical education. Prerequisites: Biology 1 and 2, and P.E. 113 or Zoology 53. 3 s.h. (E) Bookhout

117. Individual Physical Education. An analysis of exercises designed to meet specific needs. Theory and practice in teaching individual and

group gymnastics. 2 s.h. (E) Bookhout

119. Organization and Administration of Physical Education. Curriculum building in physical education. The administration of class and intramural programs. Administrative problems such as budget, equipment, facilities, interschool athletics, legal aspects, and public relations. 2 s.h. (E) McCue

120. Measurement and Evaluation in Physical Education. The contribution of measurement and evaluation to the teaching process. Practice in test selection, administration and interpretation. 2 s.h. Bookhout

130. History of the Dance. A survey of dance through the ages with emphasis on study of form, structure and content of this creative art as it

relates to the culture of each era. 3 s.h. (E) Wray

181-182. Methods and Materials in Physical Education. Basic theory and practice in teaching various types of dance, games, and sports. Laboratory hours are arranged to provide practice on the field and in the gymnasium. 6 s.h. (E) Lewis and Staff

185. Advanced Methods and Materials in Physical Education. A continuation of 181-182. Required of senior majors in physical education.

3 s.h. (E) Lewis and Staff

Health Education

101-102. Health Education Fundamentals, Methods, and Materials. Designed specifically for and open only to physical education majors. Basic studies in personal and community health; administration; curricu-

lum and program planning; health services and health counseling; selection, purchase, and care of equipment; library sources; methods and materials for effective health teaching; evaluation techniques and procedures.

dures. 6 s.h. (E) Uhrhane

134. School Health. Organization and administration of the school health program; basic health problems in schools; methods and materials for teaching about health. Primarily designed for students preparing to teach in elementary and secondary schools. Open to men and women. Juniors and seniors only. 2 s.h. (E) Uhrhane

137. Health Problems of Developing Countries. Study of health problems which are interrelated with economics, productivity, and progress of emerging nations. Concentrated study of several selected countries will be used to exemplify the problems and possibilities. Open to men

and women. 3 s.h. (E) Uhrhane

138. Health Problems of Metropolitan Areas. Housing and city planning, water resources, waste disposal, air pollution, radiation, food distribution, and mobility and migration. Open to men and women. 3 s.h.

(E) Uhrhane

140. Gereology and Health. Designed to help the college age person understand and appreciate the health problems of aging. Topics to be considered will include: emotional health implications in the changing role of the aged in our society; housing plans, nursing homes and medical care; health problems related to the degenerative diseases, accident hazards; nutrition; and health implications of retirement and leisure time activities. Open to men and women. 3 s.h. (E) Uhrhane

Major in Physical Education and Health

A major in physical education and health is offered for students who wish to teach physical education at the secondary level. The requirements meet the standards of the North Carolina Department of Public Instruction and of many other states.

Prerequisites. Biology 1-2, Psych. 91, (These courses also count as part

of the uniform course requirements.) and P.E. 101.

Major Requirements. P.E. 91, 113, 114, 117, 119, 120, 181-182, 185. Related Work. Zoology 151, H.E. 101-102. For certification in secondary teaching the related work includes: Education 100 or 113, 118, 215 and 216.

Hindi-Urdu

171, 172. Modern Indian Literature. Readings in English of the major writings of the Nineteenth and Twentieth centuries. First semester: major emphasis on the impact of English and other literatures on Bengali, Hindi,

etc., writing to the 19th and early 20th centuries. Second semester: recent and current trends. 6 s.h. Swan

181, 182. Intensive Elementary Hindi-Urdu. Four hours of classroom work, two hours of language drill. Concentration on the acquisition of conversational ability in Hindi-Urdu, with a grammar and vocabulary basic to both Hindi and Urdu. Introduction to the Devanagari script, and the reading of graded texts. 8 s.h. Swan

183, 184. Intensive Intermediate Hindi-Urdu. Four hours of classroom work, two hours of language drill. Advanced conversation in Hindi-Urdu Reading and Composition. (Prerequisite: Elementary Hindi-Urdu.) 8

s.h. Apte

Hindi 185, 186. Advanced Hindi Reading and Composition. An introduction to scholarly and literary Hindi prose, and extensive practice in composition. Prerequisite: Hindi-Urdu 183, 184, or equivalent. 6 s.h.

Swan or Staff

200, 201. Special Studies in South Asian Languages. Intensive concentration in advanced Hindi reading and conversation, or specialized, graded work in cognate South Asian languages necessary for the advanced student contemplating field work in South Asia. Prerequisite: Consent of instructor. 6 s.h. Swan and Staff

These courses are offered as an enrichment program for students interested in the South Asian subcontinent and may be taken as general electives by advanced undergraduate students. No major work is offered in Hindi-Urdu.

History

Professor Colton, Chairman; Associate Professor Young, Director of Undergraduate Studies; Associate Professor W. Scott, Supervisor of Freshman Instruction; Professors Alden, Crane, Curtiss, Durden, Ferguson, Hamilton, Holley, Lanning, Manchester, Parker, Preston, Ropp, Watson, and Woody; Visiting Professor Marshall; Associate Professors Acomb, Davis, Gillin, Hollyday, Lerner, A. Scott, Silberman, and TePaske; Assistant Professors Cell, Ginter, Mauskopf, and Rainey; Instructors Broussard, Cahow, Graham, D. Jones, R. Jones, Krantz, and Nathans

The undergraduate courses in history are designed to afford (1) an introduction to the study of history by a consideration of the history of the modern world; (2) a more intensive study of general American history; (3) opportunities for more advanced study of phases of American, English, European, Hispanic-American, Russian, and Asian history.

Course 1-2 or 51-52 or the equivalent is a prerequisite for all other courses; courses 91 and 92 are prerequisite for all 100 and 200 courses in United States history. However, seniors with written permission from the

instructor may take advanced American history courses without having had 91 and 92. Sophomores who took only one semester of course 1-2 in the freshman year may take courses 91, 92, 95, 96 or 99 concurrently with the second semester, provided they made a grade of B or above on the semester taken. Sophomores must obtain permission of the instructor in order to be admitted to courses numbered above 100; students who are not fully qualified sophomores will not be admitted to these courses. Courses for seniors and graduates are limited to twenty-five students; juniors may not elect them without special permission from the Department and the Executive Committee of the Graduate Faculty.

1, 2. A History of European Civilization. Major problems in the development and world impact of European civilization, critical evaluation of historical interpretations, and investigation of history from primary sources. 6 s.h. (E & W) Open only to freshmen. Acomb, Cell, Ferguson, Gillin, Ginter, Hollyday, D. Jones, R. Jones, Krantz, Lerner, Mauskopf, Parker, Ropp, W. Scott, and Young

43, 44. Freshman Tutorial. Readings and discussions on a tutorial basis offered as an elective to freshmen to supplement History 1, 2. 1 s.h. each

Mauskopf

51, 52. A History of European Civilization. An introductory course similar to History 1, 2 for sophomores, juniors, and seniors. 6 s.h.

91. The Development of American Democracy to 1865. A study of the trends vital to an understanding of the United States today. The main theme is the development of American democracy. Problems of foreign policy, the growth of capitalism, political practices, social reform, and conflicting ideals are considered in relation to this main theme. 3 s.h. Davis, Durden, Holley, Nathans, and A. Scott Broussard and Cahow

92. The Development of American Democracy, 1865 to the Present. A continuation of History 91 with emphasis upon the emergence of contemporary problems. 3 s.h. A. Scott; Broussard and Cahow Davis, Durden, Holley, Nathans, and

Courses 91 and 92 are intended both to serve as continuation courses in the study of history and to afford the student an opportunity to gain the understanding of the past of the United States essential for intelligent citizenship. These courses are prerequisite for all 100 and 200 courses in United States history, but this prerequisite may be waived for seniors by written permission of the instructor.

93. Modern Technology. An introduction to the history of modern Western technology, with special emphasis on the nineteen and twentieth centuries. Technological development will be related to the political, economic, and scientific trends discussed in History 1, 2. 3 s.h.

95, 96. Ancient and Medieval History. The history of mankind from preliterate man through the development of the characteristic institutions of Western Europe. The first semester deals with Ancient History; the second semester with Europe in the Middle Ages. 6 s.h. Young

99. Naval History and Elementary Strategy. After a review of earlier periods, attention is given to the importance of sea-power in more recent times and to naval actions, especially in the two World Wars. This course is not open to students who have had N.S. 102. 3 s.h. Ropp

101, 102. Introduction to the Civilizations of Southern Asia. (See Inter-

disciplinary Course 101, 102.)

103, 104. Renaissance and Reformation. Europe 1300-1648, with special attention to intellectual, religious, and social movements. 6 s.h. Krantz

105, 106. Political and Constitutional History of England. The origins and evolution of the principal institutions of the English government, related to their setting in a changing society. 6 s.h. Hamilton and Ginter

107, 108. Social and Cultural History of England. English history from the fourteenth century to the present time in an effort to arrive at a synthesis of social and political events and thus provide a background for the study of English literature. Emphasis is placed on the ages of Chaucer, Shakespeare, and Milton; the eighteenth and early nineteenth centuries; the reign of Victoria and the twentieth century. (Sophomores who made an average grade of B or above on course 1-2 may be admitted to this course.) 6 s.h. Ferguson

110. History of Rome. The Roman state to the death of Justinian; its expansion; development of its constitution and public administration; social, legal, political and economic problems; the background and setting of Christianity's rise and growth. [Listed also as Classical Studies 132]

s.h. Rogers

111, 112. America in the Colonial and Early Modern Era. Lectures upon the history of America from the discovery to the beginning of the Civil War. They will be primarily concerned with things political, institutional, and social, with occasional discussions of intellectual and cultural advance. 6 s.h. Alden

113, 114. America in the Twentieth Century. Political, economic, and social problems of twentieth-century United States. Emphasis is placed on reform movements from the Muckrakers through the Fair Deal, the emergence of the United States as a world power, and conflicting ideas and ideologies. 6 s.h. Watson

119, 120. History of Socialism and Communism. The origins and development of socialist and communist movements from pre-Marxian times

to the present. 6 s.h. Lerner

121, 122. Foreign Relations of the United States, 1775 to the Present. (first semester to 1898). With emphasis on social and economic currents as well as on diplomacy. 6 s.h. Davis

123, 124. City and Frontier in American History. The westward movement and the progress of urbanization with attention to the social and political consequences. 6 s.h. A. Scott

127. History of Latin America Through the Formation of the National

Governments. 3 s.h. Lanning and TePaske

128. Inter-American Affairs. This course treats the relations of the Latin-American states with each other and with the United States with the design of explaining the current significance of Latin America. Chief emphasis is placed upon social problems and movements common to all the republics and upon the role of the United States in Latin-American affairs. 3 s.h. Lanning

131, 132. The Development of the Major South American Powers. Political, social, and economic history of Argentina, Brazil, and Chile since independence. First semester to 1890; second semester to the

present day. 6 s.h. TePaske

135, 136. Europe in the Twentieth Century. Political, economic, and intellectual developments in Europe since 1900. First semester to 1933;

second semester to the present day. 6 s.h. Colton

137, 138. Foreign Relations of the European Powers. European diplomacy and Europe's position in the world since 1870, with an introductory survey of diplomatic institutions since the Renaissance. 6 s.h. W. Scott

- 139, 140. Nineteenth-Century Europe. With special attention to Germany and Austria-Hungary, this course emphasizes the development of European nationalism and the clash of freedom and authority. 6 s.h. Hollyday
- 141, 142. China in Modern Times. A history of China's response to the West between 1750 and the present, with some attention to cultural background. 6 s.h. Gillin
- 143, 144. History of Modern Japan. Japan from 1600 to the present; the transition from the traditional to the modern state. 6 s.h. Silberman the present. 6 s.h.
- 145, 146. Social and Economic History of England. England from 1714 to 1850. 6 s.h. Marshall
- 147. The History of India to 1757: A Survey. The history of the Indian sub-continent; classical Hindu civilization; the coming of Islam; the Mughal Empire; European penetration and rivalries; the establishment of British supremacy. 3 s.h. Crane

148. The History of India, 1757 to the Present: A Survey. Company rule and British impact; the Indian Mutiny; effects of Crown rule and development of nationalism; the Gandhian Era; the transfer of power;

problems of independence. 3 s.h. Crane

153, 154. The History of the South. A study, beginning in the colonial period, of the development of the Southern part of the United States with particular attention to its distinctive characteristics and institutions and to

their influence in shaping Southern attitudes toward major questions of

national policy. 6 s.h. Woody

157, 158. The Rise of Modern Science. A historical survey of the development of scientific ideas with attention to cultural and social influences upon science. First semester: through Newton; second semester: eighteenth to twentieth centuries. 6 s.h. Mauskopf

161, 162. Russia From Ivan the Terrible to the Present. Topics treated include the rise of the Russian state and its relations with Poland and Turkey; the agrarian problem and the rise of industry; the Russian Revolution; the political, agricultural and industrial policies of the Soviet Union; the role of the U.S.S.R. in World War II; postwar policies. 6 s.h. Curtiss and Rainey

163, 164. Reform and Politics in Nineteenth Century America. First semester: the coming of the Civil War with emphasis on the reform movements of the Jackson era, and anti-slavery crusade and national politics to 1865. Second semester: reform and politics from the Reconstruction era

to the Farmers' Revolt of the 1890's. 6 s.h. Durden

167, 168. Modern European Intellectual and Cultural History. The ideas of great innovators in European thought from the Enlightenment to

the present. 6 s.h.

- 185. The Agrarian Spirit. An interdisciplinary analysis of American history and literature, combining two ways of understanding the response to the wilderness, pre-urban individualism, agrarian democracy, and the modern reaction against industrialism. (Same as English 185.) 3 s.h. Budd and A. Scott
- 186. The Industrial Spirit. An interdisciplinary analysis of American history and literature combining two ways of understanding the rise of the city, modern industry, science and technology, corporate thinking, and the mass media. (Same as English 186.) 3 s.h. Budd and A. Scott

199. The Changing South. (See Interdisciplinary Course 199.)

For Seniors and Graduates

Students may receive credit for either semester of a hyphenated course at the 200-level without taking the other semester if they obtain written permission from the instructor and either the Director of Undergraduate or the Director of Graduate Studies.

201-202. The History of Russia, 1801-1917. The development of the Russian Empire in its political, social, and economic aspects, and the

growth of forces leading to its downfall. 6 s.h.

203-204. The United States, 1850-1900. The rise of sectionalism, secession, war-time problems of the Union and Confederacy, political and economic adjustments of Reconstruction, the status of the Negro, the New South, problems of capital and labor, the agrarian revolt, political parties and reform, the Spanish-American War. 6 s.h. Woody

205-206. The United States in the Twentieth Century. First semester: the progressive era and the first World War; second semester: the twenties and the Franklin Roosevelt administrations. (Not open to students who have had History 113.) 6 s.h. Watson

212. Recent Interpretations of United States History. A course designed to encourage a critical evaluation of major issues in United States history through examination of recent interpretations of key problems. (Open only to history graduate students and seniors doing practice teaching in

one of their final two semesters.) 3 s.h. Watson

213-214. The Old South. Political thought and party trends from Jefferson to Calhoun; agriculture, slavery, expansion; commerce, manufacturing, transportation; urban life, religion, education; the rise of Southern nationalism. 6 s.h. Woody

215-216. The Diplomatic History of the United States. A history of American diplomacy, with particular emphasis on those factors, foreign and domestic, which have shaped the foreign policies of the Republic.

6 s.h. Davis

223-224. The Old Regime and the French Revolution, 1661-1815. A study of social, political, and intellectual revolutions in continental Europe, centering on France and giving special attention to successive interpretations of historical change. 6 s.h. Acomb

225. The Reformation of the Sixteenth Century. Advanced study of the years between 1517 and 1555 with particular reference to the left wing movements of reform. 3 s.h. (Listed also in the Graduate Department of Religion as Religion 250.) Hillerbrand

226. The Age of Counter-Reformation. Advanced study of the years between 1555 and 1650. 3 s.h. (Listed also in the Graduate Department of Religion as Religion 251.) Hillerbrand

227, 228. Europe in the Nineteenth Century. A study, beginning with the career of Napoleon Bonaparte, of the forces and personalities influential in the nineteenth century. Emphasis in the first semester is on the problems of the biographer; in the second, on those of a student of national communities. 6 s.h. Parker

229. Recent Interpretations of Modern European History. A course designed to develop the ability to appraise critical historical issues through the study and discussion of recent interpretations of key historical problems in modern European history. (Open only to history graduate students and seniors doing practice teaching in one of their final two semesters.) 3 s.h. Parker

231-232. The Hispanic Colonies and Republics in America. First semester: the Spanish Conquest; the church, race, and society; universities, medicine, and science. Second semester: the wars of independence, prob-

lems of land, education, and public health. 6 s.h. Lanning

233-234. The Institutional, Cultural, and Social History of Hispanic America. 6 s.h. Lanning

235, 236. European Expansion Overseas. (1415-1898). A course dealing primarily with the processes by which European institutions were carried overseas and modified in a new environment. In the first semester the emphasis is on Portuguese, Dutch, French, and English experience to 1763. In the second semester, attention is paid to the emergence of independent centers of European culture, as in Brazil, and to the new German, French, Italian, and British empires of the nineteenth century. 6 s.h.

237-238. Europe in the Middle Ages, 395-1500. Attention is given to distinctive attributes of the period, such as feudalism and scholastic learning, and to such formative elements of European civilization as nationalism and the universities. 6 s.h. Young

241-242. Nationalism and Communism in the Far East. The growth of nationalism in China, the Japanese invasion of China, and the rise to

power of the Chinese Communists. 6 s.h. Gillin

245-246. War in the Modern World. The relations between war, politics, and technology from the Renaissance to the present. 6 s.h. Ropp

247. The History of Modern India, 1757-1857. Historiography; expansion of Company power and influence; causes of the Mutiny; problems

of analysis and interpretation. 3 s.h. Crane

248. The History of Modern India and Pakistan, 1857-1947. Historiography; Crown rule; social changes nationalism and modernization; Gandhian era and Muslim separatism partition and problems of independence. 3 s.h. Crane

249-250. Social and Intellectual History of the United States. The interplay of ideas and social practice through the examination of attitudes and institutions in such fields as science and technology, law, learning, and

religion. 6 s.h. Holley

251-252. Recent European History. A history of political, economic, and intellectual developments in Western Europe since 1870. (Not open

to students who have had 135, 136.) 6 s.h. Colton

259-260. The Emergence of the New South, 1865 to the Present. Reconstruction, industrialization, and agrarian revolt; changing status of the Negro; the South's role in the reform movements headed by Theodore Roosevelt, Woodrow Wilson, and Franklin D. Roosevelt. 6 s.h. Durden

261-262. Problems in Soviet History. Studies in the background of the Revolution of 1917 and the history and policies of the Soviet state. 6 s.h.

Lerner

263-264. American Colonial History and the Revolution, 1607-1789. The founding and institutional development of the English colonies; the background, progress, and results of the Revolution. 6 s.h. (w) Alden

265-266. Modern South America. Political, social, and economic history of the leading South American nations from the mid-nineteenth century to

the present. 6 s.h. (w)

267, 268. From Medieval to Early Modern England. The intellectual, social, and political problems of transition to modern England, with special emphasis on the English Renaissance. (Not open to students who have had 107.) 6 s.h. Ferguson

269. British History from 1714 to 1867. The Glorious Revolution, constitutional evolution, political methodology, Industrial Revolution, and reforms are among topics considered in context of the relationship of ideas

and events. 3 s.h. Hamilton

270. British History from Mid-Nineteenth Century. Liberals and Conservatives, Irish Home Rule, the empire, wars and economic decline, the welfare state. 3 s.h. Hamilton

271-272. England 1660-1832. Readings, discussion, and research in the relationships of political, social, and cultural life from the Restoration to

the Reform Bill. 6 s.h. Ginter

275-276. Central Europe, 1849-1914. Conflict between liberalism and authoritarianism, clash of nationalities, and domestic changes in Italy, Germany, and Austria-Hungary. (Not open to students who have had

History 140.) 6 s.h. Hollyday

285. Origins of Indian Civilization. A study of the formation of the classical civilization of the Indian sub-continent from the prehistoric Indus Age to the Gupta Period (4th century A.D.). Attention will be given to the development of political, economic, social and religious movements and institutions. 3 s.h. [Listed also in the Department of Religion as Religion 285] Sullivan

287-288. History of Modern Japan. The political, economic and social development of Japan since 1750; factors contributing to Japan's emer-

gence as a modern state. 6 s.h. Silberman

297. The British Empire in the Nineteenth Century. (From 1783). The development of the Empire from the American Revolution to the imperial-

ism that culminated in the South African War. 3 s.h. Preston

298. The Commonwealth in the Twentieth Century. The origins and evolution of the Commonwealth of Nations and its adjustment in the age of anti-colonialism. 3 s.h. Preston

Independent Study

191, 192. Independent Study. Directed reading and research. Open only to juniors with a B average in History and in their over-all work. Admission will be subject to approval of the individual instructor and the Department. 6 s.h. Staff

193, 194. Independent Study. Same as 191, 192, but for seniors. 6 or 12

s.h. Staff

Undergraduate Seminars

97-98. Sophomore Seminar. Open to sophomores on application to the Director of Undergraduate Studies and with permission of the instructor. 6 s.h.

The following seminars are designed to offer opportunities for reading and historical investigation in significant problems. Juniors as well as seniors may apply for admission to these courses, and are urged to do so if they expect to be candidates for graduation with distinction in History or if they expect to practice-teach in their senior year. All seminars are open to non-majors as well as to majors.

195A-196A. Renaissance Intellectual History. Studies in the transformation of European thought between 1300 and 1600. 6 s.h. Krantz

195B-196B. Seminar in Twentieth-Century Europe. (Students may not receive credit for this course and 251-252) 6 s.h. (w) Colton

195C-196C. Problems in American Intellectual History. (Students may

not receive credit for this course and 249-250.) 6 s.h. Holley

195D-196D. The Progressive Era Through the New Deal. 6 s.h. Watson

195E-196E. Seminar in American History Before 1789. 6 s.h. Alden 195F-196F. Problems in Nineteenth Century American Reform and Politics. (Students may not receive credit for this course and 163-164.) 6 s.h. Durden

195G-196G. Nationalism and Communism in the Far East. 6 s.h. Gillin

195H-196H. From Rural to Urban Society in the United States. 6 s.h. A. Scott

195I-196I. Nationalism and Freedom in Nineteenth Century Europe. 6 s.h. Hollyday

195J-196J. The History of International Socialism and Communism. International Socialist and Communist movements from Utopian Socialism to the present. 6 s.h. Lerner

195K-196K. European Expansion and Imperialism. Selected problems in European expansion, concentrating on the age of discovery, the "new imperialism," and the contemporary era of anti-colonialism. 6 s.h. Cell

196.99. History Honors Pro-Seminar. Required in the spring semester of juniors selected for the Senior Honors Seminar of the following year. Conferences on selection of research topics and research techniques. 1 s.h. Holley and Parker

197-198. Senior Honors Seminar. A course designed to introduce qualified students to advanced methods of historical research and writing and to the appraisal of critical historical issues. Open only to seniors, but not restricted to candidates for degree with distinction. This course, when taken by a history major, would be in addition to the 6 semester hours

required in 195-196 seminars or 200-level courses of the History Department. 6 s.h. Holley and Parker

Departmental Major

Prerequisite. The introductory course in History (1-2 or 51-52).

Major Requirements. Students desiring to take a major in history are required to elect, in addition to History 1-2 or 51-52, 24 semester hours in the Department, including six semester hours in either an undergraduate seminar (195-196) or any course in the 200 group. Students are urged to take History 91-92; in any case those wishing to take the more advanced courses in American history should elect History 91-92 in the sophomore or junior year.

Honors. Any student who is qualified (see the section on Honors in this *Bulletin* for general requirements) may undertake work leading to a degree with distinction in History by presenting himself to his History faculty advisor as a candidate. Normally, Honors work involves participation in one of the Undergraduate Seminars during the junior year and selection for the Senior Honors Seminar in the senior year. Further information is available at the History Department office (236 Allen).

Courses Approved for Related Work in History

Anthropology.

Art. History of Art

Economics. But not the courses listed under business administration and accounting except those in economic geography

Education. 54, 104, 225

English and American Literature.

German, Greek, Latin, Russian, and the Romance Languages. The literature courses that are not primarily conversation or composition courses

Greek, Latin. Except those courses that are primarily grammar or composition

Interdisciplinary. 101, 102, 199

Linguistics. 101

Music. History of Music

Philosophy. Except 48

Political Science.

Psychology. 91, 100, 101. And other courses if specifically approved Religion. Especially those numbered above 100

Sociology.

Honors-Masters Program

For a brief description of this program see page 56 of this *Bulletin*. *Colloquium 101*, 102. The University and the Scholar. Selected readings and informal discussion about such topics as the role of universities, the art of teaching, academic freedom, and other related matters. 2 s.h.

Interdisciplinary Courses

The following are cooperative courses offered by the departments concerned. Where a department accepts the course for the major, the same number is used as a departmental offering. Certain other departments ac-

cept these courses as related work.

101, 102. Introduction to the Civilizations of Southern Asia. Hindu, Islamic, and Buddhist foundations, impact of the West, and emergence of the modern nation-states of Southern Asia. The first semester will analyze traditional Hindu civilization and the Islamic impact on Southern Asia. The second semester will examine western influences and the development of modern societies and states in Southern Asia. 6 s.h. Apte, Braibanti, Crane, McCormack, Reed, Rowe, Spengler, Sullivan

199. The Changing South. A survey of the geography, demography, economics, politics and culture of the South. (See Anthropology, History,

Political Science, Sociology.) 3 s.h. (w)

Italian

For courses offered in Italian, see Romance Languages, page 164.

Latin

Four courses offered in Latin, see Classical Studies.

Linguistics

The courses in Linguistics may be taken as electives by advanced students; certain courses serve as related work in several departments (see the entries for related work under the separate departments).

No major is offered in Linguistics. Students interested in the study of language as a part of their undergraduate program or as a preparation

for graduate work in linguistics should consult the instructors of the

courses listed below.

101. Introduction to Linguistics. Origin and nature of language, methods of descriptive linguistics with reference to historical and comparative linguistics. No specific prerequisite except sophomore standing. 3 s.h. Seymour

For a description of the following courses consult the listings under the specified department.

Language and Society (Anthropology 238) Apte and McCormack

Linguistic Anthropology (Anthropology 260, 261) Apte

Development of the English Language (English 161)

Modern English Grammar (English 162)

Old English Grammar and Readings (English 207) Nygard

History of the English Language (English 208) Nygard

Old French Literature (French 219) Vincent

Middle High German (German 205, 206) Seymour

History of the German Language (German 216) Seymour

Symbolic Logic (Philosophy 103) Clark and Wilson

Philosophy of Language (Philosophy 109) Welsh

General Semantics and Theory of Language (Philosophy 246) Wilson

Romance Linguistics (Romance Languages 224) Hull Old Spanish Language (Spanish 275) Davis

Mathematics

Professor Roberts, Acting Chairman; Professor Dressel, Director of Undergraduate Studies; Associate Professor Reynolds, Supervisor of Freshman Instruction; Professors Carlitz, Elliott, Murray, Shoenfield, Warner, and Woodbury; Adjunct Professor Sewell; Associate Professors J. Burlak, Gallie, and Williams; Assistant Professors Baxley, Bryson, Burdick, Helling, Hinrichs, Hodel, Kitchen, Moore, Patrick, Scoville, Smith, Srivastav, and Stackelberg; Instructors Mrs. J. A. C. Burlak, Means, and Schorr

The following program of courses in Mathematics is planned for 1967-68.

Fall. 17, 21, 22, 41, 51, 63, 64, 83, 111, 113, 135, 139, 217, 221, 233, 235, 245, 271, 283, 285, 289, 291.

Spring. 21, 22, 42, 51, 63, 68, 111, 112, 114, 131, 136, 140, 204, 218, 222,

234, 236, 246, 272, 284, 286, 290, 292.

17. Introduction to Finite Mathematics. A course designed to introduce students to some of the concepts in modern mathematics. Elementary

logic, sets and subsets, vectors and matrices, and probability theory are studied. Some applications of these topics to the biological, social, and physical sciences are considered. Prerequisite: three units of college pre-

paratory mathematics. 3 s.h. (w) Staff

18. Elementary Statistics. An introduction to statistics with emphasis on fundamental concepts. Topics studied include summarization of data, mean and standard deviation, normal, binomial and other distributions, sampling, statistical estimation, and testing hypotheses. Prerequisites: Mathematics 17. 3 s.h. (w) Staff

21, 22. Introductory Calculus. Real numbers, rectangular and polar coordinates, trigonometric and inverse trigonometric functions, logarithmic and exponential functions, conic sections, vectors, limits, derivatives, maxima and minima, methods of integration, areas, volumes, moments, centroids, indeterminant forms, improper intervals. Prerquisite: three units of college preparatory mathematics. Mathematics 21 is prerequisite for Mathematics 22. 6 s.h. (E & W) Staff

41, 42. Introductory Calculus. A special course covering the topics of Mathematics 21, 22 in a more extensive and rigorous fashion, designed for students who have demonstrated marked proficiency in mathematics. Credit for this course and Mathematics 21, 22 is not allowed. Prerequisite: four units of college preparatory mathematics. 6 s.h. (w) Staff

51. Introduction to Digital Computation. Flow charts; binary arithmetic; an assembly language; program structures, subroutines, linkages, recursion; data structures, arrays, polynomials; an algorithmic language; numerical linear algebra, matrix inversion, linear programming, estimation of parameters by criteria of Gauss and Chebyshev. A fee of \$8.00 is charged for this course. The fee is payable to the Treasurer's Office of Duke University at the beginning of the semester. Prerequisite: three units of college preparatory mathematics. 3 s.h. (w) Gallie

63. Intermediate Calculus. Taylor's formula, infinite series, partial derivatives, solid analytic geometry with vectors, functions of several variables, multiple integrals. Prerequisite: Mathematics 22. 3 s.h. (w)

Staff

64. Intermediate Calculus. Taylor's formula, infinite series, partial derivatives, multiple integrals. Prerequisite: Mathematics 63. 3 s.h. (w)

Staff

68. Introduction to Linear Algebra. A basic course in the Geometry of vectors in Euclidean n-space, real vector spaces, simultaneous equations, linear transformations and matrix representation, elementary row operations, equivalence and similarity of matrices, determinants, and quadratic forms. Prerequisite: Mathematics 17 or 21. 3 s.h. (w) Staff

83. Intermediate Calculus. A continuation of Mathematics 41, 42 with coverage including the topics of Mathematics 63 and related basic topics in mathematics. Credit for this course and Mathematics 63 is not allowed.

Prerequisite: Mathematics 42; or permission of the Director of Under-

graduate Studies in Mathematics. 3 s.h. (w) Staff

111. Applied Mathematical Analysis I. Ordinary and partial linear differential equations with constant coefficients, Fourier series and their applications, vectors. Not open to students who have had Mathematics 131. Prerequisite: Mathematics 63. 3 s.h. (w) Staff

112. Applied Mathematical Analysis II. Complex variables, residues, conformal mapping, matrices, Laplace and Fourier Transforms and their

applications. Prerequisite: Mathematics 63. 3 s.h. (w) Staff

113, 114. Modern Algebra. Vector spaces, linear transformations, matrices, elementary theory of groups, rings, and fields. Prerequisite: Mathematics 63 for 113; and 113 for 114. 6 s.h. (w) Warner

131. Elementary Differential Equations. Solution of differential equations of elementary types; formation and integration of equations arising in applications. Not open to students who have had Mathematics 111.

Prerequisite: Mathematics 63. 3 s.h. (w) Staff

133. Basic Statistics. Principal statistical methods including application to psychological, economic, business administration, and educational problems. Techniques of data collection and presentation, hypothesis testing, using the chi-square, t, and F distributions, interval estimation, and linear regression. Not open to students who have had Economics 138 or Psychology 117. 3 s.h. (w) Bryson

135, 136. Probability and Statistics. Permutations and combinations, total and compound probability, Bayes' formula, Bernoulli's theorem, discrete distributions, central values, moments and mathematical expectation, law of large numbers, probabilities in continuum, continuous distributions, sampling distributions, confidence limits, tests of hypotheses, and analysis of variance. Prerequisite: Mathematics 63 for 135; and 135 for 136. 6 s.h. (w) Burdick

139, 140. Advanced Calculus. Multiple integrals and Jacobians, infinite series, power series, differential equations, vector analysis, line and surface integrals, Green's theorem, Stoke's theorem, improper integrals. Prerequisite: Mathematics 64 for 139; and 139 for 140. 6 s.h. (w) Elliott

141, 142. Junior Mathematics Seminar. An honors course designed to coordinate and advance the mathematical knowledge of students who have demonstrated marked proficiency in mathematics and who desire intensive and rigorous work in this subject. Student reports will be required. Prerequisite: Mathematics 68 and 83 for 141; and 141 for 142; or permission of the Director of Undergraduate Studies in Mathematics. 6 s.h. (w) Staff

183, 184. Senior Mathematics Seminar. An honors course continuing the work in Mathematics 141, 142, designed primarily for seniors. Prerequisites: Mathematics 141 and 142 for 183; and 183 for 184. Mathematics 183 and 184 must be preceded or accompanied respectively by

Mathematics 217 and 218. 6 s.h. (w) Staff

For Seniors and Graduates

204. Geometry for Teachers. Metric and synthetic approaches to plane and solid geometry; affine geometry; an algebraic model of Euclidean

geometry. 3 s.h. Reynolds

217, 218. Analysis. Introduction to set theory, construction of real and complex numbers beginning with the Peano postulates, elementary topology of real and complex numbers, properties of continuous functions, derivatives, mean value theorem, Riemann integral, fundamental theorem of integral calculus. Prerequisite: Mathematics 64 for 217; and 217 for 218. 6 s.h. (w) Stackelberg

221, 222. Numerical Analysis. Scientific programming, numerical analysis, error analysis, interpolation, numerical differentiation and integration, summation, numerical solutions of ordinary differential equations, real and complex roots of equations, solution of simultaneous equations and matrix inversion, calculation of eigenvalues and eigenvectors, numerical solution of partial differential equations, linear programming and least squares techniques. Prerequisite: Mathematics 63 for 221, and 221 for 222. Patrick

227, 228. Theory of Numbers. Congruences, arithmetic functions, compound moduli, quadratic reciprocity, Gauss sums, quadratic forms, sums of squares. Prerequisite: Mathematics 64 for 227; and 227 for 228. 6 s.h. (w) Carlitz

229, 230. Algebraic Numbers. Ideals, unique factorization, divisors of the discriminant, determination of the class number. Prerequisite: Mathe-

matics 113 for 229; and 229 for 230. 6 s.h. (w) Carlitz

233. Statistical Methods. Parameter estimation and hypothesis testing from samples, linear regression, correlation, analysis of variance and covariance, components of variance, multiple regression. 3 s.h. (w) Bryson

234. Sample Designs. Methods of constructing and analyzing survey designs; elements of simple random sampling, stratified sampling, multistage sampling; methods of estimation; questionnaire construction; refusals and not-at-homes. Prerequisite: Mathematics 233. 3 s.h. (w) Bryson

235, 236. Abstract Algebra. Groups, fields, rings, matrices, quadratic and bilinear forms, general Galois theory, hypercomplex systems. Prerequisite: Mathematics 64 for 235; and 235 for 236. 6 s.h. (w) Smith

244. Design of Experiments. Methods of constructing and analyzing designs for experimental investigation, Latin square, split-plot, simple and partially confounded factorial designs, incomplete block designs, treatment of missing data, techniques of experimentation. Prerequisite: Mathematics 233. 3 s.h. (w) Burdick

245, 246. Combinatorial Analysis. Generating functions, distributions,

partitions, compositions, trees, and networks. Prerequisite: Calculus. 6

s.h. (\mathbf{w}) Carlitz

247, 248. Arithmetic of Polynomials. Field theory, detailed study of finite fields, special polynomials and functions, valuation theory, the zeta function. Prerequisite: Mathematics 235 or consent of the instructor for 247; and 247 for 248. 6 s.h. (w) Carlitz

262. Non-Parametric Statistics. A study of statistical tests in which no assumption about the underlying distribution is made; single and multiple sample tests for nomial and ordinal scales; non-parametric measures of correlation, efficiency of tests. Prerequisite: Mathematics 244, or consent of the instructor. 3 s.h. (w) Bryson

271, 272. Introductory Topology. Basic set theory; topological spaces; separation axioms, metric spaces, continuity; connectedness; paracompact-

ness. Prerequisite: Calculus. 6 s.h. (w) Hodel

273, 274. Algebraic Topology. Homology and cohomology theories; complexes; introduction to homotopy groups, Cech homology theory.

Prerequisite: Mathematics 272. 6 s.h. (w) Hinrichs

283. Probability for Engineers. Basic probability concepts, the sample space, discrete and continuous events, permutations and combinations, conditional and marginal probability, discrete and continuous distributions, estimation, hypothesis testing, confidence intervals, multiple regression, one-way analysis of variance. Prerequisite: Mathematics 64. 3 s.h. (w) Burdick

284. Least Squares Analysis of Linear Models. General linear models; geometrical interpretations; multiple regression; one-way and multi-way analysis of variance; fixed, random, and mixed models; experimental design models; analysis of covariance; introduction to non-linear models. Prerequisite: Mathematics 136 or 283. 3 s.h. (w) Burdick

285. Applied Mathematical Methods I. Vectors, line and surface integrals, tensors, complex variables, differential and integral equations.

Prerequisite: Mathematics 64. 3 s.h. (w) Dressel

286. Applied Mathematical Methods II. Wave equation, Fourier series, heat equation, telegraphic equations, Legendre polynomials, Bessel functions, Schrödinger's equation. Prerequisite: Mathematics 64. 3 s.h. (w) Dressel

287, 288. Foundations of Mathematics. Propositional calculus, predicate calculus, axiomatized number theory. Gödel completeness and incompleteness theorems. Recursive functions; hierarchies; constructive ordinals. Set theory; consistency of the axiom of choice. Prerequisite: Mathematics 64, or consent of instructor for 287; and 287 for 288. 6 s.h. (w) Shoenfield

289. Applications of Stochastic Processes I. Recurrent events, random walk, Markov chains and processes, queueing theory, branching and dif-

fusion processes. Prerequisite: Mathematics 135 and 140, or consent of the instructor. 3 s.h. (w) Williams

290. Applications of Stochastic Processes II. Linear operators, spectral representations, time series, multivariate analysis, auto-regressive schemes, Gaussian processes, cross-correlation functions, smoothing, filtering, prediction, Wiener-Hopf equation, diffusion processes, Fokker-Planck equation, first-passage times. Prerequisite: Mathematics 289 or consent of the instructor. 3 s.h. (w) Williams

291, 292. Theory of Functions. Limits, implicit functions, power series, double series, Cauchy's theorem and its applications, residues, Riemann surfaces, conformal mapping. Prerequisite: Mathematics 64 for 291; and

291 for 292. 6 s.h. (w) Warner

Departmental Major

For the A.B. degree:

Prerequisite. Mathematics 21, 22.

Major and Related Work. 42 semester hours.

Major Requirements. Mathematics 63, 64 or 68, and 18 semester hours in courses in mathematics numbered above 100.

Related Work. 18-24 semester hours of course work from the following departments: chemistry, economics and business administration, philosophy, physics. Two courses above the introductory level must be taken in at least one of these departments.

For the B.S. degree:

Prerequisite. Mathematics 21, 22.

Major and Related Work. 48 semester hours.

Major Requirements. Mathematics 63, 64 or 68, and 18 semester hours in courses in mathematics numbered above 100.

Related Work. 14-24 semester hours of course work in the natural sciences. Two courses above the introductory level must be taken in at least one of these departments.

The Department offers work leading to graduation with distinction. See

the section on Honors in this Bulletin.

Medical Science

This course in medical science has been approved by the Faculty

Council as appropriate for the Bachelor's degree.

M201. Anatomy as Related to Locomotion. (Not being offered 1967-68.) The part of the body concerned with locomotion and posture will be dissected completely, whereas the thoracic, abdominal and pelvic organs, and the deeper structures of the head will be taught by means of

audio-visual aids and prosections. September to January. Prerequisites: One year each of biology, chemistry, and physics. 6 s.h. *Markee and Everett: Becker and Duke*

Music

Professor Hamilton, Chairman; Professor Mueller, Director of Undergraduate Studies; Professor Bone, Associate Professors Bryan, Earls, Hanks, Saville and Withers; Visiting Artist Ciompi; Assistant Professors Di Cecco and Hendrix; Instructors Fishbaugh, Friedberg, Henry, and McCall; Mme. Phelps, Mr. Strassler

Courses in music are offered for the general student who wishes to acquire knowledge of music as literature and, on a more technical level, for those prepared to major in the field. The courses marked * are open to general students without prerequisite.

Theory and Composition

65, 66. Music Theory I. Harmony and Theory of Music. Manipulation and analysis of melodic, harmonic, rhythmic, contrapuntal and formal principles of tonal organization through written exercises, ear training, sightsinging and keyboard harmony. Three lectures, two laboratory hours throughout the year. 8 s.h. (E) Earls and Fishbaugh

115, 116. Music Theory II. Advanced Harmony and Counterpoint. First semester, exercises in advanced harmonic techniques and studies in formal analysis; second semester, emphasis on contrapuntal techniques and writing in the smaller forms. Prerequisite: Music 65-66. Two lectures; two laboratory hours throughout the year. 6 s.h. (E) Earls and Fishbaugh

- 117, 118. Music Theory III. Composition and Analysis. The development of technical and expressive means in various media and styles through practical exercises in composition and analysis of larger forms. The completion of an original work in an instrumental or choral medium. Prerequisite: Music 115-116 or consent of the instructor. 4 s.h. (E) Hamilton
- 122. Orchestration. The technical characteristics and transpositions of the instruments of the modern symphony orchestra and concert band. Instrumentation of piano scores of original compositions for string, woodwind, brass ensembles. Prerequisites: Music 65, 66, 115, 116 or consent of the instructor. 3 s.h. (E) Bone

History and Literature

1-2.° Introduction to Music Literature. The literature of music of Western civilization; acquisition of critical insights into musical styles,

forms and techniques. Representative works of major composers in all media, instrumental and vocal. Open only to freshmen; others, see Music

51-52 and 51X-52X. 6 s.h. (E) Henry

51-52. **Introduction to Music Literature.** The aims of this course are identical with those of Music 1-2; the content and method are adapted to the capacities of upperclassmen. Open only to upperclassmen who have not completed Music 1-2. 6 s.h. (E) Staff

51X-52X. *Introduction to Music Literature. A special section for music majors and advanced general students. A historical, stylistic survey of

music literature from 1600 to the present. 6 s.h. (E) Mueller

masterworks of Music Literature. An intensive study of selected masterworks which represent the principal currents in modern music history. Compositions by Bach, Mozart, Beethoven, Brahms, Debussy and Bartok will constitute a frame of reference for historical, biographical and stylistic analysis. 3 s.h. (E) Hamilton and Mueller

134.° Choral Literature. Choral works from the Renaissance to the present; the mass, motel, cantata, oratorio, and passion. Aesthetic and religious concepts; formal and stylistic means. Selected composers selected from Josquin to Stravinsky. Individual projects. 3 s.h. (E)

Saville

135. Piano Literature. A survey of the great works for ke, board instruments, from the time of the English virginal composers to the present. Prerequisites: Music 47A, 48A, 97A, and 98A, or consent of the instructor. 3 s.h. (E) Withers

136. Solo Song Literature. A study of selected standard repertoire: early Italian and English songs, German lieder; the French, English and American art song and the standard operatic aria. Open to voice students

and others by consent of the instructor. 3 s.h. (E) Hanks

139. Twentieth Century Music. The course will trace the most influential creative stylistic developments in music of the present century. A critical survey will emphasize works by key figures Bartok, Berg, Schonberg, and Stravinsky as a means of establishing a relative standard of values for subsequent independent exploration. Prerequisite: A one-year course in Music Theory or Literature, or consent of the instructor. 3 s.h. (E) Hamilton

147-148. History of Music. The development of music as a manifestation of Western culture, principally from the Middle Ages to 1790, with some attention to ancient and early modern influences. Prerequisite: A one-year course in Music Theory or Literature preferably Music 51X-52X), or consent of the instructor. 6 s.h. (E) Saville

149. Organ Literature. Great works for organ from 1350 to 1750. Interpretive analysis illustrated through performance whenever practicable. Registration and style relating to the technical capacities of organ construction in each period studied. Emphasis on J. S. Bach.

Open to organ students and other by consent of the instructor. 3 s.h. Hendrix

163. *Music in the Eighteenth Century. The development of important instrumental and vocal media and formal concepts through study of the music, the musicians and their environment. 3 s.h. (E)

164. *Music in the Nineteenth Century. Beethoven to Debussy; the artistic and literary influences in the cultural life of the period. 3 s.h.

Mueller

- 165. *Opera Literature. From the Florentine Camerata to the present. The operatic idea, with attention to changing relationships of music and text: opera as social commentary; formal and stylistic means. Selected composers from Monteverdi to Schuller. Individual projects. 3 s.h. (E) Saville
- 173. World Music. Musical cultures of the world, emphasis on nonwestern music, especially the art music of the Far East, Southeast Asia, the Near and Middle East; folk music of selected areas. 3 s.h. (E) Earls

Independent Study and Senior Seminar

Admission to these courses will be subject to approval of the Director of Undergraduate Studies of the Department of Music and the individual instructor. The instructor as well as the course content will be established in accordance with the individual student's interests and capacities.

The Department offers work leading to graduation with distinction. See

the section on Academic Honors on page 54.

191, 192. Independent Study. Directed reading and research and musical analysis within a prescribed area of musical literature. Open only to highly qualified students in the junior year, by permission of the department. See page 56. 6 s.h. (E) Staff

193, 194. Independent Study. Same as 191, 192 but for seniors. See

page 56. 6-12 s.h. (E) Staff

197, 198. Senior Seminar in Music. Offers guidance in the sources and materials of musical literature, and in the methods of stylistic analysis and criticism. A background of historical, stylistic, and theoretical knowledge is essential. Formal papers will be required. Open only to seniors, but not restricted to candidates for degree with distinction. 6 s.h. (E)

Music Education and Pedagogy

57-58. Vocal Diction. Problems of diction as specifically applied to the art of singing. Required of all Applied Voice Majors. 2 s.h. (E) Hanks 106. Piano Methods and Materials. A study of the materials and methods of piano pedagogy. The appropriate choice of essential and supplementary literature. Development of technique, style, and musicianship. Supervised practice teaching. Prerequisite: Music 47A, 48A, 97A, and 98A, or consent of the instructor. 3 s.h. (E) Withers

145-146. Techniques of Keyboard Ensemble and Accompanying. A performance-oriented survey of the ensemble and accompaniment literature. Prepared assignments, sightreading and studio work with singers and instrumentalists. Prerequisite: a working level of keyboard efficiency. 2 s.h. Friedberg

151. Public School Music Education (Elementary). Development of the child through music. Child voice and song literature; rhythmic activities; learning to listen; use of elementary instruments such as the autoharp, psaltery, bells, rhythm band instruments. Both group and individual help in elementary music theory; music reading exercises; chording and improvising piano accompaniments; conducting; construction of rhythm band scores. Integration of music with other activities, such as planning music for social studies units. 3 s.h. (E) McCall

152. Public School Music Literature (Elementary). A study and analysis of key works in the symphonic, pianistic, and vocal repertoire which are particularly applicable to the teaching of music appreciation as a cultural aspect of social studies in the public school. 3 s.h. (E) Mc-

Call

153. Vocal Music in the Public School (Secondary). Repertoire and techniques for teaching vocal music in the junior and senior high schools. Aims, organization, administration, training, and performance of school choirs and ensembles; care of the changing voice. 3 s.h. (E) Saville

154. Instrumental Music in the Public School (Secondary). Materials and methods of teaching instrumental music in the junior and senior high schools; emphasis on teaching technics, repertoire, organization, and administration of the instrumental curriculum. 3 s.h. (E) Bone

Applied Music

The study of Applied Music concerns the understanding of music literature through performance. Instruction is offered in the following media: A. Piano; B. Strings; C. Woodwinds; D. Brass; E. Voice; F. Ensemble—Instrumental, Piano, Vocal coaching and performance; participation through one of the Departmental Ensembles listed at close of the Music section; G. Organ. Instruction in media A through E may be private or in classes limited to a minimum of 4 and a maximum of 7 students. Class instruction is restricted to the first 4 grades of proficiency. Class instruction shall be designated by adding the letter X to the appropriate medium and year-in-school classification. (Example: junior year, Woodwinds, class instruction is recorded 147CX.)

Students must arrange an audition with the instructor prior to registration in Applied Music courses. The course numbers listed below refer

to the student's class standing and not his musical proficiency.

Students must contact the Music Department office so as to arrange an audition with the appropriate instructor *prior to registration in Applied Music courses*. The course numbers listed below refer to the student's class standing and not his musical proficiency.

Piano. 47A, 48A; 97A, 98A; 147A, 148A; 197A, 198A. For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) Withers, Fishbaugh and

Phelps

Violin, Viola, 'Cello. 47B, 48B; 97B, 98B; 147B, 148B; 197B, 198B. For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) Ciompi and Di Cecco

Woodwinds. 47C, 48C; 97C, 98C; 147C, 148C; 197C, 198C. For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) Henry

Brass. 47D, 48D; 97D, 98D; 147D, 148D; 197D, 198D. For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) Bryan

Voice. 47É, 48E; 97E, 98E; 147E, 148E; 197E, 198E. For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) Hanks and Strassler

Ensemble. 47F, 48F; 97F, 98F; 147F, 148F; 197F, 198F. For freshmen, sophomores, juniors, seniors. 1 s.h. (E) *Staff*

Organ. 47G, 48G; 97G, 98G; 147G, 148G; 197G, 198G. For freshmen,

sophomores, juniors, seniors. 1 or 2 s.h. (E) Hendrix

Credits. Credit for instruction in media A, B, C, D, E, and G is granted on the basis of 2 s.h. per semester for one hour of private instruction per week and a minimum of six hours practice weekly; or 1 s.h. per semester for one-half hour of private instruction, or one period of class study, and a minimum of six hours practice per week. An additional weekly class meeting for performance and criticism may be required by the instructor without additional credit.

Credit for instruction in medium F is granted on the basis of 1 s.h. per semester for one rehearsal period of instruction and a minimum of three hours practice per week.

Music majors. Shall plan their Applied Music study so as to meet the

following requirements of their chosen areas of concentration:

Majors in Music Theory or Music History and Literature should earn a minimum of 6 s.h. credit in Applied Music.

Majors in Applied Music must register for one hour of private instruction per semester and may earn a maximum of 18 s.h. credit in

Applied Music.

Majors in Music Education who expect to teach music in the public schools should plan their Applied Music programs in consultation with the Director of Undergraduate Studies in Music. The credit hours in Applied Music required for certification in North Carolina may be earned through a program which includes the study of a major medium, a minor medium and participation in departmental organizations. (See p. 12 of this *Bulletin*).

Nonmajors. Students other than music majors may receive not more than 8 s.h. credit for work in Applied Music. They may elect after consultation with the Department either 1 hour (2 s.h. credit) or ½ hour (1 s.h. credit) of private instruction per semester. No credit in Applied Music will be allowed unless the student satisfactorily completes at some time before graduation six semester hours in Music Theory, or Music History and Literature.

Fees. Upper class students who have been accepted as music majors at the time of registration for applied music courses are exempt from paying the applied music fees. Other students are charged for all applied music

media except "F" (Ensemble).

Fees are payable to the Treasurer's office of Duke University upon notification from that office at the beginning of each semester as follows:

One ½ hour private lesson per week for one semester.......\$45.00 Two ½ hour private lessons per week or one 1-hour private One 1-hour class lesson per week for one semester..... 20.00

All students registered for applied music instruction are charged for practice room facilities-students having practice facilities off campus must notify the departmental office of this fact by the end of the third week of each semester; otherwise they will be automatically billed as follows:

Medium A. Piano \$15.00 per semester (room with piano or organ) Medium E. Voice Medium G. Organ Medium B. Strings Medium C. Woodwinds (\$10.00 per semester (room without piano) Medium D. Brass Medium F. Ensemble No practice room fee is charged

Departmental Major

Prerequisites. Music 51-52 and 65-66.

Major Requirements. A minimum of 24 s.h. beyond the prerequisite courses including Music 115-116 and 147-148. Participation in one of the departmental Ensembles or Organizations during each semester of undergraduate study.

During Orientation Week all prospective entering Freshman Music Majors are required to take: A. Piano proficiency exam., B. Theory profi-

ciency exam., C. Audition in their major performance medium.

Areas of Upperclass Specialization

Concentration in one of four major areas in Music is possible in the junior and senior years. While the following outlines include more than

the number of hours *required* for a major in music, they are strongly recommended by the Department as a basis for effective study.

Theory and Composition

Required: Music 117-118, 122; Applied Music: 6 s.h.

Additional Departmental Recommendations: Music Electives: 6 s.h.

History and Literature

Required: 2 Elective Courses in Music Literature; plus Music 197, 198; Applied Music: 2 s.h.

Additional Departmental Recommendations: Music Electives: 10 s.h.,

including a minimum of 4 s.h. in Applied Music.

Applied Music. A program of study designed for those students who intend to become performers and teachers of applied music.

Required: Applied Music: 12 s.h.

Additional Departmental Recommendations: Applied Music: 6 s.h.; Piano or Organ: Music 135 or 149; 106 (Piano Majors only); Voice: Music 136; 57-58; Other Media: Study sequence to be worked out in consultation with the Director of Undergraduate Studies.

Music Education. A program of study designed for prospective teachers of High School Instrumental or Vocal Music. Details of this program are shown on page 12 of this Bulletin.

Departmental Ensembles

Brass Ensemble Chamber Orchestra Madrigal Singers

Piano Ensemble (may be in combination with Instruments or Voice)

String Ensemble (Sonata, Trio or Quartet)

Vocal Ensemble (Opera Workshop)

Woodwind Quintet

Departmental Organizations

Duke University Concert Band

Duke University Symphony Orchestra

Naval Science

Professor Caldwell, Captain, U. S. Navy, Chairman; Associate Professor Butner, Lieutenant Colonel, U. S. Marine Corps, Director of Undergraduate Studies; Assistant Professors: Grayson, Major, U. S. Marine Corps; Rumelhart, Lieutenant Commander, U.S. Navy; Degnon, Lieutenant, U.S. Navy; Tate, Lieutenant, U.S. Navy; Hobbs, Lieutenant, U.S. Navy

Standardized titles and numbers for courses are established by the Bureau of Naval Personnel for use at the 52 NROTC institutions. The first digit indicates the year of the course; the second digit (o) indicates that it is given on a semester basis; the third digit indicates the semester of the school year in which offered. Specialized courses for Marine Corps Officer candidates are indicated by the letter "M" after the number, and substitute for the basic course of the same number.

NS 101. Naval Orientation. History of navy regulations, naval customs and courtesies which are basic to further study of Naval Science. Introduction to carrier, air, surface, undersea, and amphibious warfare; basic types, characteristics, capabilities, and limitations of naval vessels; deck seamanship; naval formations and maneuvers. 3 s.h. (w) Tate

NS 102. Naval History. Naval history relating the development of sea power to other aspects of world history as a basis for understanding the

role of navies in the world today. 3 s.h. (w) Tate

91. Introductory Psychology. See page 115 of this Bulletin for course description. This is a University course required for all NROTC midshipmen.

NS 201. Naval Weapons. A survey of the fundamentals of naval weapons and systems including the gun-weapon delivery problem, antisubmarine warfare, missiles, nuclear weapons, and space technology and their application to the control of the seas. 3 s.h. (w) Degnon

NS 301. Navigation. Magnetic and gyro compasses; principles of chart construction; dead reckoning; piloting, nautical astronomy including a study of the actual and apparent motion of the earth, celestial coordinates, times systems, the astronomical triangle, identification of stars and planets; solutions of observations for lines of position; and work in practical navigation. 3 s.h. (w) Hobbs

NS 302. Naval Operations. A survey of the components of general naval operations including concepts and application of relative motion, collision prevention, communications, weather, and the command and delegated functions involved in maneuvering single ships and multiship formations.

s.h. (w) Hobbs

NS 401. Naval Engineering. Principles of steam engineering as related to naval power plants for main propulsion and auxiliary machinery; principles of the marine nuclear engineering propulsion system; principles of ship stability and damage control; a general understanding of internal combustion engines. 3 s.h. (w) Rumelhart

NS 402. Principles and Problems of Leadership. A study of the principles and problems of effective leadership with emphasis on the role of the military leader. Leadership precepts of personal example, sound management practice, and moral responsibility; human relations; discipline and administration of military justice are included. 3 s.h. (w) Rumelhart

NS 301M. Evolution of the Art of War. The evolution of weapons, strategy, tactics and material of war; a summary of the development of U. S. Military and foreign policy. For Marine Corps Candidates. 3 s.h. Grayson

NS 302M. Modern Basic Strategy and Tactics. Modern tactical principles and techniques, especially on the small unit level. For Marine

Corps Candidates. 3 s.h. (w) Grayson

Nursing

The nursing program is published separately in the Bulletin of the School of Nursing. (See inside of front cover.)

Philosophy

Professor Baylis, Chairman; Professor Wilson, Director of Undergraduate Studies; Assistant Professor Mahoney, Supervisor of Freshman Instruction; Professors Clark, Negley, Peach, and Welsh; Assistant Professor Spector; Visiting Assistant Professor Tice

The undergraduate program in the Department of philosophy is designed to acquaint students with the content and the structure of philosophical theory in various areas. Discussion is encouraged so that the student can engage actively in the philosophical examination of problems.

Course offerings fall into two general categories: the systematic and the historical. In a systematic treatment, the organization of a course is primarily in terms of the problems presented by the subject-matter of that course, as in logic, ethics, metaphysics, etc. In historical courses, attention is directed more to the order of development in the thought of a particular philosopher (Plato, Aristotle, Kant, etc.), or in a historical period. In all courses, reading of the works of philosophers will acquaint the students with the important and influential contributions to the definition and solution of philosophical issues.

The problems raised in philosophy in respect to the various field of the arts and sciences involve questions which are not normally given attention in those particular disciplines. In the consideration of such problems, therefore, it is expected that the student will acquire some understanding and perspective of the major areas of man's intellectual endeavor. In this sense, philosophical comprehension is an essential part of a student's learn-

ing and education.

41, 42. Knowledge, Fact, and Value. An introduction to philosophy through the study of some of its main problems. These include, in

Philosophy 41, the nature of truth and fact, of evidence, faith and knowledge, and of the fundamental categories descriptive of the universe. In Philosophy 42 these include the nature and ground of values, ultimate goals, and moral obligation. (Philosophy 42 may be taken before, or with, Philosophy 41.) Not open to juniors and seniors who have not already had one of the sequence. 6 s.h. Staff

43, 44. Freshman Tutorials. Open only to students concurrently en-

roled in Philosophy 41 or 42. 1 s.h. (E) Peach

48. Logic. A study of the conditions of effective thinking and clear communication. Examination of the basic principles of deductive reasoning.

s.h. Clark, Spector, and Welsh

93, 94. History of Philosophy: Ancient and Modern. An introduction to philosophy through the study of some of the major writings of the ancient Greek philosophers (93) and modern philosophers through Kant (94). 6 s.h. (E) (Open to freshmen with a B average.) Mahoney, Spector, Peach and Wilson

101. Philosophy of Religion. A philosophical examination of selected

concepts and doctrines of religion. 3 s.h. (E)

103. Symbolic Logic. Detailed analysis of deduction and of deductive systems. Open to sophomores by permission of instructor. 3 s.h. (E) Clark and Wilson

104. Philosophy of Science. The principal philosophical and methodo-

logical problems in contemporary science. 3 s.h. (E) Spector

107. Political and Social Philosophy. Discussion of the fundamental principles of political and social organizations, with particular attention to democratic philosophy, corporate theory, and Marxist-Soviet philosophy. 3 s.h. (w) Negley

108. Social Ideals and Utopias. Reading of selected Utopias; analysis of the value-structures and political principles of these ideal societies.

3 s.h. (w) Negley

109. Philosophy of Language. A philosophical analysis of problems arising in the study of language and symbolism. Topics include: Theories of language, the nature of signs and symbols, theories of meaning, types of discourse (scientific, mathematical, poetic), definition, ambiguity, metaphor. 3 s.h. (E) Welsh

110. Epistemology. A treatment of the problems of truth and knowledge; of a priori and empirical statements; and of theories of perception

and probability. 3 s.h. (E) Baylis

111. Metaphysics. A consideration of a selection from the following: Hegelian essentialism and existentialist reaction; traditional treatments of the mind-body problem: dualism, phenomenalism and materialism; rival theories of causation, space and time. 3 s.h. (E) Baylis and Wilson

117. Ancient and Modern Ethical Theories. The development of ethical thought in the West; the interaction between culture and ethical theory,

with special reference to the Greek city-state, Roman law, the Renaissance, the Reformation, and the rise of modern science. Readings in the

great ethical philosophers. 3 s.h. (E) Welsh

119. Introduction to Medieval Philosophy. Development of philosophy from late antiquity to the sixteenth century. Topics will include Augustine, Avicenna, Averroes, Albert the Great, Aquinas, Scotus, Occam and Latin Averroism. 3 s.h. (E) Mahoney

For Seniors and Graduates

202. Aesthetics: The Philosophy of Criticism. A study of some fundamental issues in aesthetics with particular reference to the fields of literature, music and painting. Problems discussed include the role of standards in criticism, aesthetic judgment, interpretation and evaluation in the arts, meaning in the arts, art and truth, the arts and morality. Open to juniors with the approval of the instructor. 3 s.h. Welsh

203. Contemporary Ethical Theories. Study of the nature and justification of basic ethical concepts in the light of the chief ethical theories of twentieth century British and American philosophers. 3 s.h. Baylis

205. The Philosophy of History. Discussion of the method, metaphysical implications, and influence of interpretations of history; Hegel, Marx, Spengler, Toynbee. 3 s.h. (w) Negley

208. Political Values. Analysis of the systematic justification of political principles and the political values in the administration of law. 3 s.h. (w)

Negley

211. Plato. A critical study of the dialogues with special emphasis on problems in ethics, epistemology, and metaphysics. 3 s.h. (E) Mahoney

217. Aristotle. A study of parts of the Organon, Physics, De Anima, and

Metaphysics. 3 s.h. (E) Mahoney

218. Medieval Philosophy. An examination of the course of philosophy from the end of the ancient period to the fifteenth century. Special attention will be given to Augustine, Avicenna, Averroes, Albert the Great, Aquinas, Siger of Brabant, John of Jandun, Duns Scotus, and William of Occam. 3 s.h. (E) Mahoney

219. Kant. Reading and discussion of his philosophy, with some at-

tention to historical continuity. 3 s.h. (w) Negley

225. British Empiricism. A critical study of the writings of Locke, Berkeley, or Hume, with special emphasis on problems in the theory of knowledge. 3 s.h. (E) Peach

227. Continental Rationalism. A critical study of the writings of Descartes, Spinoza, or Leibniz with special emphasis on problems in the

theory of knowledge and metaphysics. 3 s.h. (E) Peach

228. Recent and Contemporary Philosophy. A critical study of some contemporary movements in philosophy with special emphasis on the

work of Moore, Russell, Wittgenstein, Wisdom, and Ryle. 3 s.h. (E) Welsh

229. American Pragmatism. Studies in the philosophy of Pierce, James,

Dewey, and Mead. 3 s.h. (E) Welsh

233. Introduction to the Philosophy of Science. Central problems in the methodology of the sciences, e.g., the concept of a scientific explanation, the nature of laws, theory and observation, and other topics. 3 units. (Given every Fall) Spector

234. Philosophy of Science. Problems in the philosophy of the physical and non-physical sciences. Space and time, measurement, probability and induction, the philosophy of the behavioral and social sciences. Pre-

requisite: Consent of the instructor. 3 units. Spector

235. Philosophy and the Sciences. Problems in the philosophy and methodology of the sciences; emphasis on the writings of philosophers and scientists in the history of science, such as Galileo, Newton, Mach, Poincare, and Einstein. 3 units. Spector

The above two courses are normally given alternate Spring semesters. **241.** Logic. Fundamental problems of logic. 3 s.h. (E) Clark and

Wilson

246. General Semantics and Theory of Language. An examination of semantical theory through Frege, Russell, Church, Tarski, Carnap, and Quine, together with a consideration of the implications of meaning theory for general philosophy. Prerequisite: Philosophy 103 or the equivalent. 3 s.h. (E) Wilson

247. Philosophical Cosmology. Problems relating to the nature of indi-

viduals, space, time and causality. 3 s.h. (E) Wilson

- 250. Philosophical Analysis. A critical study of recent and contemporary essays in philosophical analysis, and an evaluation of the nature, methods, and results on this movement. 3 s.h. (E) Baylis, Clark, and Wilson
- **252.** *Metaphysics.* A critical and evaluative study of rival metaphysical theories and their bases. Analysis of the fundamental metaphysical categories and of metaphysical methods. 3 s.h. (E) *Baylis, Clark, and Wilson*
- 291, 292. Critical Philosophy. The analysis of basic philosophical concepts and beliefs with a view to critical evaluation and constructive emendation of them. Emphasis on the practice as well as the principles of philosophical criticism and problem solving. 3 s.h. each. Enrollment only by permission of the department. 291 is ordinarily prerequisite for 292.

 (E) The Graduate Staff

Departmental Major

Philosophy 48 (Logic) is recommended for all those intending to major

in philosophy. Philosophy 41, 42 is ordinarily a prerequisite to major work.

Major requirements. 24 semester hours in philosophy of which at least eighteen must be in courses numbered above 48. The following must be included: Philosophy 93, and 94; Philosophy 117, or 203, or 208; and 6 semester hours in Philosophy senior-graduate courses.

Related Work. Six hours minimum in each of two departments approved by the philosophy adviser. Courses may not be those primarily open to freshmen. There is no restriction in principle as to departments in which related work may be taken, and the approval of the Philosophy adviser is required only to insure some coherence in the program of major and related work as a whole.

The Department offers work leading to graduation with distinction. See the section on Honors.

Physics

Professor Fairbank, Chairman; Professor Meyer, Director of Undergraduate Studies; Professor Carpenter, Supervisor of Freshman Instruction; Professors Biedenharn, Fowler, Gordy, Greuling, Lewis, Newson and Robl; Associate Professors Bilpuch and Robinson; Assistant Professors Beres, Carpenter, Evans, Fortney, Guyer, Hunt, Roberson, Rose, and Walter; Lecturer Barton; Instructors Cook and Holman

- 1-2. Introductory Physics. This course traces historically and experimentally the development of the important principles of physics. This course is open to freshmen, sophomores and juniors and meets the general science requirement. Three lectures and one two-hour laboratory each week. 8 s.h. (w) Carpenter, Barton, Holman and Assistants
- 41-42. General Physics. This course treats the basic principles of general physics in a more quantitative manner than Physics 1-2. It meets in a thorough way the physics requirement for entrance into the study of either medicine or engineering, and is well suited for the general science student. This course is not open for credit for students who have completed Physics 1-2. Three lecture-recitations and one three-hour laboratory period each week. Prerequisites: Mathematics 21, 22 or equivalent (Mathematics 21, 22 may be taken concurrently). 8 s.h. (w) Beres, Evans, Fairbank, Fowler, Grenling, Lewis, Roberson, Walter and Assistants
- 161, 162. Modern Physics. Review of electromagnetic fields, relativity, quantum phenomena, atomic and molecular spectra, solids, and nuclear physics. Three lectures each week. Prerequisites: Physics 41-42, Mathematics 22. 161 is prerequisite for 162. 6 s.h. (w) Roberson, Carpenter

171. Electronics. A.C. circuits, transients, fundamentals of vacuum

tubes and electron physics, basic electronic circuits. Three lectures and one three-hour laboratory each week. Prerequisite: Physics 41-42. 4 s.h.

176. Intermediate Physics-Thermodynamics and Kinetic Theory. The elements of thermodynamics, kinetic theory and elementary statistical mechanics. Three lectures per week. Prerequisites: Physics 41-42, and differential and integral calculus. 3 s.h. (w) Meyer

181-182. Classical Mechanics. Newtonian mechanics at the intermediate level. Motion of systems of particles and rigid bodies; conservation theorems; small oscillations; force problems and classical scattering. 6 s.h. (w) Staff

A course in general college physics, validated by examination, and a course in differential and integral calculus are prerequisites to all courses

numbered 200 and above.

202. Advanced Mechanics. General dynamics of systems of particles and rigid bodies; the methods of Lagrange, Hamilton and Jacobi; special relativity. 6 s.h. Robl

215. Introduction to Quantum Mechanics. Wave-mechanics and elementary applications; the hydrogen-like atoms; electron spin and angular momentum; operators and eigen-values; stationary state perturbation theory; identical particles. Prerequisites: Physics, 162, 182 or equivalents; Mathematics 285–286 should be taken concurrently. 3 s.h. (w)

217, 218. Advanced Physics Laboratory. Experiments involving the fields of mechanics, electricity magnetism, heat, optics and modern

physics. 6 s.h. (w) Meyer

220. Advanced Electronics. Vacuum tubes and solid state devices, advanced circuit analysis. Three lectures and one three-hour laboratory each

week. 4 s.h. (w) Hunt

221, 222. Theoretical Physics. Mechanics of particles and of rigid bodies, elasticity, fluids dynamics, electrodynamics; optic, relativity, thermodynamics, statistical mechanics, wave mechanics. Prerequisite: Mathematics 285-286 or equivalent to be taken at least concurrently. 6 s.h. (w) Cook

223. Electricity and Magnetism. Electrostatics, magnetostatics and potential theory; dielectric and magnetic media; magnetic field of currents and law of induction. 3 s.h. (w) Robinson

224. Electricity and Magnetism. Maxwell's electrodynamics, theory of wave optics, refraction, interference and diffraction. Prerequisite: Physics

223. 3 s.h. (w) Robinson

225, 226. Elementary Investigations. The aim of this course is to provide training in the laboratory and library methods of physical research. Properly qualified students may conduct elementary investigations under the supervision of a member of the staff. 3-6 s.h. (w) Staff

Departmental Major

A student wishing to major in physics should arrange to complete the necessary mathematics as soon as possible. Special sections (denoted by "x" in the course schedule) have been arranged in Physics 41-42 and 161-162. These sections are primarily for physics majors, and it is recommended that persons planning to major in physics should attempt to fit them into their schedules. This recommendation is not a requirement however. Since Physics 1-2 is intended primarily for non-science majors, it is not recommended for physics majors.

For the A.B. degree:

Prerequisites. Physics 1-2 or 41-42 or equivalent, and Mathematics 21, 22.

Major Requirements. At least 18 semester hours in physics from

Physics 161, 162, 171, 176, 217, 218, 181, 182, 223, 224, 215.

Related Work. Eighteen to 24 semester hours from the following courses: Mathematics 63, 64, 113, 139, 140, and Chemistry 1, 2 or 1 and 42.

For the B.S. degree:

Prerequisites. Physics 1-2 or 41-42 or equivalent, and Mathematics 21, 22 or equivalent.

Major Requirements. Physics 161, 162, 171, 176, 181, 182, 223, 224,

217, and 218.

Related Work. Fourteen to 24 semester hours from the following courses: Mathematics 63, 64, 113, 139, 140, and Chemistry 1, 2 or 1 and 42.

The department offers to the student in his senior year the possibility of being associated with research conducted in this institute. Such work may lead to graduation with distinction. See the section of Honors.

Political Science

Professor Hallowell, Chairman; Professor Leach, Director of Undergraduate Studies; Professors, Ball, Braibanti, Cole, Kulski, Proctor, Rankin and Wilson; Associate Professors Hall, Howard and Simpson; Visiting Associate Professor Cook; Assistant Professors Kornberg and Strange; Instructors Bushoven, Hart, Miller and Rooks

The objective of the Department of Political Science is to acquaint students with the theory and practice of government and politics at the local, state, national and international levels. While primary attention is focused upon the American political and administrative system, emphasis is also placed upon a comparative study of the political institutions and movements of thought peculiar to the nations of Europe, Latin America,

Africa and Southern Asia. The student's attention is also directed to the problems encountered in international organization, politics and law. The development of political philosophy from Plato to the present day is an essential part of the department's course offerings. Methods of study include the empirical, the historical, the legal, the comparative and the philosophical.

Directing its effort to an intelligent understanding of the contemporary world and of the responsibilities which are laid upon citizens of a democracy, the Department of Political Science shares the objectives of a liberal arts education. While the department does not aim at vocational education, the knowledge it seeks to impart should be useful to anyone

contemplating a career in the government service or politics.

Students intending to major in the department should take Political Science 11-12 or 61-62. Ordinarily one of them must be taken before proceeding to more advanced work in the department. This rule may be waived with the consent of the Director of Undergraduate Studies.

The advanced courses are divided into four major groups. Majors are required to take at least three semester hours in three of these groups.

The Senior Seminar is designed to provide an opportunity for majors in the department to pursue independent study and research, and to qualify for graduation with distinction.

Introductory Courses

11-12. American and European Political Systems. An introduction to the theory and practice of modern government. An introductory course for freshmen dealing with the topics indicated in the description of Political Science 61-62. (Open only to freshmen) 6 s.h. (E & W) Hall; Bushoven, Hart, Miller, and Rooks

61-62. American and European Political Systems. An introduction to the theory and practice of modern government. The first semester is devoted to the study of American constitutional democracy. Topics examined include federal-state relations, the separation and interelationships of the executive, legislative and judicial branches of government, judicial review, the role of political parties and public opinion, the formulation and execution of domestic and foreign policy, civil liberties. The second semester is devoted to a study of constitutional democracy in Great Britain and France with emphasis upon the similarities and differences between those systems and our own. Detailed attention is also given to an examination of the theory and practice of totalitarian dictatorship as exemplified in the U.S.S.R. (Not open to Freshmen.) 6 s.h. (E & W) Leach; Cook, Simpson; and Howard; Kornberg and Strange; Breckenridge, Bushoven, Hart, Miller, and Rooks

Political Theory and Methodology

- 123. Introduction to Political Philosophy. A course devoted to the reading and discussion of selected political classics including Plato's Republic, Aristotle's Ethics and Politics and other works as time permits. 3 s.h. (w) Hallowell
- 126. Democratic Theory and Political Reality. Normative goals and empirical analyses of existing democratic states. Urgent problems confronting democratic governments and their ability to meet them. 3 s.h. (w) Strange
- 127. Introduction to Law. An introduction to the nature and functions of law, with emphasis on the varied uses of law in ordering society, the process of legal growth and the nature of legal reasoning. Some attention will be given to basic issues of jurisprudence. 3 s.h. (w) Open only to Juniors and Seniors. Howard

131. Introduction to American Political Thought. Basic elements in the American political tradition as developed from its English roots to the

present. 3 s.h. (w) Leach

222. Empirical Theory and Methodology. The research process in political science in terms of the possibilities for the quantitative analysis of data. Emphasis is on the construction of empirical theory, particularly conceptualization, hypothesis formation and testing. 3 s.h. (w) Kornberg

223. Political Philosophy from Plato to Machiavelli. Intensive analysis of the political philosophies of Plato and Aristotle, a survey of medieval political thought and an analysis of the significance of Machiavelli. 3 s.h.

(w) Hallowell

224. Modern Political Theory. An historical survey and philosophical analysis of political theory from the beginning of the seventeenth to the middle of the nineteenth century. Attention is given to the rise of liberalism, the Age of Enlightenment, the romantic and conservative reaction, idealism and utilitarianism. 3 s.h. (w) Hallowell

229. Recent and Contemporary Political Theory. The rise of positivism and its impact upon modern political thought, the origins of socialism, Marxism and its variants, socialism in the Soviet Union, nationalism, Fascism and National Socialism, the crisis in modern democracy, Chris-

tianity and the social order. 3 s.h. (w) . Hallowell

231. American Political Theory. An analysis of the main currents in American political thought from colonial beginnings to the present day, with emphasis upon the development of liberalism in America. 3 s.h. (w) Hallowell

249. Comparative Political Analysis and Political Development. General methodology of comparison of political systems. Institutional, structural, functional and configurative modes of analysis. Theory of

political development. Theoretical problems of induced political change. 3 s.h. *Braibanti*

Comparative Government and Politics

136. Major European Governments. A general introductory survey of the governments of Great Britain, France, Germany, Italy, and the Soviet Union. Special attention is given to constitutional developments, the organization and ideologies of political parties, and current political problems. 3 s.h. (w) [Not open to students who have taken Political Science 12 or 62 but open to all others without prerequisite.]

151. Comparative Government and Politics: Latin America. A study of politics and government in selected Latin American states, including Argentina, Brazil, Chile and Mexico. Political forces and their impact

upon governmental institutions. 3 s.h. Ball

155. Problems of Political Development in the New States. Survey of change and modernization in Africa and Asia; nationalism and neutralism, role of political parties, the military, and the bureaucracy in nation building; economic growth and foreign aid. 3 s.h. (w) Miller

165. The Government and Politics of the U.S.S.R. An analysis of the governmental institutions, party structure and policies of the Soviet Union. Attention will be given to policies affecting the intelligentsia, the workers

and the peasants. 3 s.h. (w) Kulski

166. Soviet Foreign Relations. An analysis of relations between the Soviet Union and other states (Communist and non-Communist, Western and underdeveloped) as well as of the relations between the Communist Party of the Soviet Union with Communist parties in other countries. 3 s.h. (w) Kulski

180. Comparative Government and Politics: Southern Asia I. Concepts of political development in new states, using India, Pakistan, Ceylon and Malaya as case studies. Theory and practice of foreign aid and technical assistance as agents of political modernization. 3 s.h. (w) Braibanti

- 181. Comparative Government and Politics: Southern Asia II. The political modernization of India and Pakistan since 1947. Constitutional developments as revealed in leading court judgments will be studied. Other topics will be the ideology of administrative reform, formulation of state polity, rural development and party politics. 3 s.h. (w) Braibanti
- 225. Comparative Government and Politics: Western Europe. Modern political institutions and processes in Western Europe. 3 s.h. Cole
- 235. The British Commonwealth. An analysis of the political relationships between the members of the Commonwealth and a comparative study of the political systems of the Commonwealth countries, with particular reference to Canada. 3 s.h. (w) Cole

250. Comparative Government and Politics: Southern Asia I. The

political development of India and Pakistan. Contextual determinants of the political systems. Political consequences of partition. National integration, constitutional and institutional aspects of the political systems. Impact of foreign technical assistance. 3 s.h. *Braibanti*

251. Comparative Government and Politics: Southern Asia II. The political development of India and Pakistan with emphasis on politicization, administrative reform, party politics and the rural development

movements. 3 s.h. Braibanti

280. Comparative Government and Politics: Sub-Saharan Africa. Particular attention will be given to traditionalism and modernization, ideologies, leadership, party systems, the adaptation of parliamentary institutions, Africanization of the civil services, and the problem of political integration. 3 s.h. (w) Proctor

American Government and Public Administration

125. American Political Parties and Practical Politics. A study of the historical development, organization, and methods of political parties in the United States. 3 s.h. (w) Simpson

128. The Judicial Process. The judicial process and the role of the judiciary in the development of public policy in the United States. 3 s.h.

(w) Open only to Juniors and Seniors. Howard

129. Groups in American Politics. The composition, methods, and policies of groups as they participate in the creation of public opinion and in the formulation of public policy. Ethnic groups, the Negro and the

poor. 3 s.h. (w) Strange

137. Political Behavior in Elections. The behavioral approach will be used to examine decision-making in the political process. Attention will be focused on the major factors that affect the outcome of elections, such as the characteristics of the American voter, the conduct of campaigns, the influence of propaganda and public relations techniques, and the influence of campaign finance. 3 s.h. (w)

138. Political Behavior in Policy Making. A study of the major factors that come into play in the making of governmental policy decisions. Special attention will be paid to the role of pressure groups and the methods of their lobbyist representatives, to the effects of pressures from constituents, and to the pressures of the executive and legislative branches

upon each other. 3 s.h. (w)

141. Public Administration. An introduction to the role of administration in the governmental process considering principles of administrative organization, methods of administrative control, personnel and fiscal management. In general the study of the organizational and administrative problems encountered by any government agency charged with carrying out a public policy. 3 s.h. (w) Hall

- 142. Administrative Responsibility. An evaluation of political, legal and administrative methods of achieving a responsible bureaucracy in American national government. Comparisons will be made with relevant experience and techniques in other countries such as Great Britain and France. 3 s.h. (w) Hall
- 146. Legislation. A study of the composition and structures of legislative bodies and of the legislative process with attention to procedure, methods, techniques, delegation of discretion, and the use of controls. 3 s.h. (w) Simpson

161. Government and Planning. A study of the planning functions at all levels of government in the United States. Particular attention will be devoted to the problems posed for planning by metropolitan growth. 3 s.h. (w) Leach

164. Government Regulatory Policy and Administration. A consideration of selected regulatory policies of the American national government, such as anti-trust, transportation and communications, and of the administrative procedures and organizations designed to effect those policies. 3 s.h. (w)

174. Political Implications of Economic Legislation. A study of political and sectional alignments in the passage of tariff, farm, railway, New Deal

and other economic legislation. 3 s.h. (w) Simpson

199. The Changing South. (See Interdisciplinary Course 199.)

207. American Constitutional Law and Theory. A study of the leading principles of American government, as developed through judicial interpretation of the Constitution. 3 s.h. (w) Rankin

208. American Constitutional Law and Current National Problems. A study of the influence of recent Supreme Court decisions upon the political and constitutional development of the United States. 3 s.h. (w)

Rankin

209. Problems in State and Local Government in the United States. A study of the historical development of state and local governments, their present organization and subdivisions, and their relation to each other. Special attention is given to the position of the states in the federal union through the study of federal-state, inter-state, and state-local relations. 3 s.h. (w) Rankin and Leach

230. American Political Institutions. A study of the formation and development of institutions of the national government in the United States, with historical and analytical treatment. Among other topics this course is concerned with the Constitutional Convention of 1787, and the development of Congress, the Presidency, and the Supreme Court. 3 s.h. (w) Rankin

234. Civil-Military Relationships in American Government. A consideration of the role of the military in American government both in theory and in practice. Special emphasis will be given to formal civil-military

structural arrangements for determining policies, such as the National Security Council, and to the degree of civilian control within the military establishment. 3 s.h. (w)

- 241. Administrative Management. An advanced course in public administration with special attention being given to the development of scientific management, its application to government in the United States and a consideration of current problems in organization, procedures, work simplification, and management improvement. 3 s.h. (w) Hall
- **242.** National Administration. A study of the administrative organization, working concepts and procedures of the United States Government, illustrated through the operations of the Bureau of the Budget. 3 s.h. (w) Hall
- 244. Administrative Law and Process. The nature and law of the administrative process in the context of American government and politics, with special attention to the powers, procedures, and judicial control of administrative agencies. 3 s.h. (w) Hall
- 246. Government Administration and Public Policy. Through use of the laboratory and case study techniques, a consideration of the types of administrative problems that the United States Government encounters in the field of public policy, and their possible solution. 3 s.h. (w)
- **275.** The National Party System. An intensive examination of selected facets of American national political parties, such as: relationships between presidential and congressional politics, the politics of national conventions, recent foreign policy and party alignments, and the controversy over party government. 3 s.h. (w) Kornberg
- 276. Comparative State Parties and Politics. A selective analysis of party patterns in the states, including such topics as: classification schemes for state party systems, the impact of various nominating procedures on party organization, relationships between national and state politics, and the influence of party system on the operation of state government, with special attention to the South. 3 s.h. (w)
- 285. The Judicial Process. A study of judicial decision-making in the United States, with emphasis on the process of litigation, the recruitment of judges, the influences and limits on judicial decisions, and their impact within the political system. Prerequisites: Political Science 127, 207 or their equivalents. Not open to students who have completed Political Science 128. 3 s.h. (w) Howard
- 291. Problems of Urban Government. Analysis of problems in the structure and functions of urban governments in the United States 3 s.h. (w) Leach
- 292. Urban Administration. A study of principles and methods relating to municipal administration in the United States. 3 s.h. (w) Leach

International Law and Relations

politics; the analysis of national power; the instruments of foreign policy; and the controls of state behavior. 3 s.h. (E & W) Proctor; Hart

122. Modern International Politics. An examination of the major problems of post-war international politics with particular attention to the extension of Soviet power, the Western response to this challenge, and the revolutions in the Afro-Asian world. 3 s.h. (E & W) Proctor; Hart

124. The New States of Africa in World Affairs. A study of the international political problems arising from the emergence of independent

states in sub-Saharan Africa. 3 s.h. Proctor

158. Control of American Foreign Policy. A consideration of the forces which are responsible for the formulation of American foreign policy, and a study of the important factors which have influenced contemporary United States policy in the major areas of the world. The course includes an analysis of the respective roles of the President, Congress, Department of State, and the United Nations, as well as military and public opinion. 3 s.h. (w) Ball

220. Problems in International Politics. Such topics as nuclear power, bipolarity and polycentrism, nationalism, national interests and ideology, the revolution of modernization and regional integration. 3 s.h. Kulski

221. International Public Organization. A study of the structure and functioning of the United Nations organs, or related specialized agencies such as the International Labor Organization, and of regional agencies such as the Organization of American States and the North Atlantic Treaty Organization. 3 s.h. (w) Wilson and Ball

227-228. International Law. Elements of international law, particularly as interpreted and applied by the United States; rights and duties of states with respect to recognition, state territory and jurisdiction, nationality, diplomatic and consular relations, treaties, treatment of aliens, pacific settlement of disputes, international regulation of the use of force, and collective responsibility. 6 s.h. (w) Wilson

Independent Reading and Undergraduate Seminars

191, 192. Independent Study. Directed reading and research. Open only to qualified Juniors by permission of the Director of Undergraduate Studies and of the individual instructor. 3-6 s.h. Staff

193,-194. Independent Study. Directed reading and research. Open only to qualified Seniors by permission of the Director of Undergraduate Studies and of the individual instructor. 3-6 s.h. Staff

195, 196. Junior Seminar in Political Science. Prerequisites: Political

Science 11-12 or 61-62 and the consent of the instructor. Open to non-

majors as well as to majors. Staff

197, 198. Senior Seminar in Political Science. A seminar concerned with the development, scope and research methods of political science. A major research paper is prepared by each student. Required of all political science majors who are candidates for degree with distinction. Open only to Seniors. Prerequisite: Consent of the instructor. 6 s.h. (w) Staff

Departmental Major

Prerequisite. Political Science 11-12 or 61-62.

Major Requirements. Eighteenth semester hours of work in the Department above courses 11-12 or 61-62, including at least six semester hours of 200 courses. Majors must take at least three semester hours in each of three fields.

Related Work. Eighteen hours in departments approved by the Political Science adviser, of which at least six hours must be taken in each of two departments and no more than six hours may be in courses primarily open to freshmen. Related work is usually taken in the departments of economics, history, philosophy, psychology and sociology and in Inter-disciplinary Course 101, 102.

The Department offers work leading to graduation with distinction. See

the section on Honors.

Portuguese

For courses in Portuguese, see Romance Languages, p. 164.

Psychology

Professor Alexander, Chairman; Professor Brehm, Acting Director of Undergraduate Studies; Professors Adams, Dai, Diamond, Guttman, Jones, Kimble, Wallach; Associate Professors Altrocchi, Borstelmann, Carson, R. Erickson, Lakin, McHugh, Schiffman, Wing; Research Associate Professor Gaffron; Assistant Professors C. Erickson, Kremen, Linder, Lockhead, Singer; Lecturers Botwinick, Clifford, Cohen, E. Crovitz, H. Crovitz, Eisdorfer, Feather, Gehman, Huse, Krugman, Obrist, Peele, Shmavonian, Somjen, Stedman, Thompson

Psychology 91 or its equivalent is a prerequisite for all other courses in psychology. Six semester hours in psychology (including Psychology 91) or special permission of the course instructor or the Director of Undergraduate Studies are required for admission to all psychology courses over 140.

91. Introductory Psychology. An introduction to the facts, principles, and problems of psychology through a study of motivation, emotions, perception, sensation, thinking, memory, learning, social behavior, individual differences, and personality. Offered both semesters. 3 s.h. (E & W) Staff

100. Personality. Representative theories of personality, from Freud to the present, emphasizing problems of normal personality structure, dynamics, development, and assessment. Not open to students who have

had Psychology 116. 3 s.h. Alexander and Kremen

101. Introductory Social Psychology. Problems, concepts and methods in the study of social interaction and interpersonal influence. Topics include: Socialization; social factors in perception and learning; psychological principles underlying conformity; conditions affecting social interaction. 3 s.h. Jones and Linder

104. Comparative Psychology. An examination of the bearing upon general psychological theory of experimental investigations of animal behavior in the fields of motivation and learning. 3 s.h. (w) Adams

110. Applied Psychology. Applications of psychology to problems of personnel selection, industrial efficiency, advertising and selling, and other

problems of practical interest. 3 s.h. (w) McHugh

111. Advanced General Psychology. A more intensive study of several selected problem areas in the field of general psychology with special emphasis on experimental methods and findings in the areas considered. 3 s.h. (w) Kimble

116. Psychology of Personality. Personality theories, with an emphasis upon personality structure, dynamics and development. Therapeutic activities in relation to specific personality theories. Not open to students who have had Education 68 or Psychology 100. Open normally to nursing students and to others by permission of the instructor. 3 s.h. (w) E. Crovitz

117. Statistical Methods in Psychology. Elementary statistical techniques and their application to the analysis and interpretation of psychological data. Theory of inference is stressed. 3 s.h. (w) Staff

118. Experimental Methods in Psychology. The procedures and methods of human and animal experimentation in such areas as learning,

motivation, and perception. 3 s.h. (E) Staff

121. Child Psychology. A survey of theory and research on growth and behavior from infancy to adolescence, with special emphasis upon personality and cognitive development. 3 s.h. (w) Borstelmann, McHugh and Singer

122. Adjustment of the Pre-School Child. Study and application of techniques of observing, recording and interpreting the behavior of the pre-school child. The course is designed to meet the needs of students interested in the personality, development and social adjustment of

children. One hour lecture and 4 hours laboratory. Prerequisite: Psy-

chology 121. 3 s.h. (E) Staff

126. Adolescent Psychology. The mental, social and emotional development of adolescence and youth will be studied with special attention given to such topics as interests, motivations, home problems, sex differences, recreation, delinquency, and development of citizenship. Prerequisite: Psychology 121 or Education 118, or permission of the instructor. 3 s.h. (w) McHugh

130. Principles and Methods of Psychological Evaluation. This is an introductory course in test methods used by psychologists in measuring and evaluating mental processes. The nature, purposes and utilization of various types of tests and psychological techniques will be discussed and demonstrated. Among the tests to be studied will be standard scales of intelligence; tests of special abilities, aptitudes, attitudes and interests; personality tests, rating scales and projective methods. Prerequisite: Psychology 117. 3 s.h. (w) Wing

132. The Psychology of Individual Differences. A study of the nature and causes of individual and group variations in intelligence, special abilities, social and emotional characteristics. These will be considered in relation to developmental sequence, aging factors, sex, race, biological inheritance, education and socio-economic conditions. Prerequisite: Psy-

chology 130 or permission of instructor. 3 s.h. (w) Staff

141. Personality and Behavior Disorder. Behavior disorder studied from the viewpoint of the psychological principles underlying the adjustment of the deviant personality. Prerequisite: Psychology 100. 3 s.h. (w) Altrocchi, Carson, Lakin and Singer

142. Instrumental Behavior. A laboratory course using animal subjects in operant conditioning situations. Class members carry out a series of observations on conditioning, discrimination, motivation, and other basic phenomena. 3 s.h. (w) Guttman

144. The Psychology of Learning. A survey of the basic facts and principles of human and animal learning. Students in the course will

perform an independent experiment. 3 s.h. (w) Kimble

145. Experimental Approaches to Personality. Experimental methods applied to personality research with emphasis upon psychological studies in such areas as anxiety, conflict and frustration. Students will perform representative experiments. Prerequisite: Psychology 100 or permission of the instructor. 3 s.h. (w) Wallach

147. Experimental Social Psychology. Intensive consideration of selected problems in group dynamics, attitude change, and interpersonal perception. Current research and theory are stressed. Class members conduct individual research projects. Prerequisite: Psychology 101 or permission of the instructor. 3 s.h. (w) Brehm and Jones

148. Psychology of Perception and Thinking. A study of the basic

phenomena of perception and thinking as determined by conditions in the external situation and in the person, biological and psychological. Students will perform representative experiments. 3 s.h. (w) H. Crovitz

149. Motivation. Examination of the contemporary use of such concepts as instinct, drive, and expectancy in the explanation of behavior. The role of nervous mechanisms and hormones in the control of goaldirected behavior. 3 s.h. C. Erickson

151. Psychology and International Relations. This course will explore the application of psychological theories to problems of international relations including those concerned with inter-group conflict and its resolution, group identification and ethnocentrism, and the complexities of national character. The course will be problem oriented and conducted on a seminar basis. Theoretical papers and experimentation along the lines of topics mentioned above will be expected. Prerequisites: Psychology 91, 100 or 101, and consent of the instructor. (w) Lakin

152. Physiological Psychology. Neural bases of behavior, sensory and motor functions of the nervous system, and problems of emotion, motivation, and consciousness. Laboratory in psychophysics and the electrical activity of the nervous system. Prerequisites: Physics 1-2 or Chemistry 1-2 or permission of instructor. 3 s.h. (Formerly Psychology 112.)

Erickson

153. Introduction to Biological Psychology. Application of biological principles to psychology. Among the concepts considered are species, gene, homeostasis, internal environment, reflex, synapse, organ, and receptor specificity. Phylogeny of the cortex treated in detail. Prerequisite: Biology 1-2 and Comparative Anatomy, or permission of the instructor. 3 s.h. (Formerly Psychology 108) Diamond

160. Psychopathology of Childhood. Disorders of childhood from the point of view of psycho-social development. Recent theory and research on problems ranging from learning inhibitions to schizophrenia. Current views of etiology, treatment, and preventive measures, with emphasis on the role of the family and school. Prerequisite: Psychology 121 or 141 and the permission of the instructor. Offered annually, 3 s.h. Singer

171, 172. Junior Tutorial. Small group discussions of influential books and articles in psychology. Prerequisites: 6 s.h. in psychology and permission of Director of Undergraduate Studies. 4 s.h. Brehm and Staff

173, 174. Senior Tutorial. Small group discussions of influential books and articles in psychology. Prerequisite: 12 s.h. in psychology and permission of Director of Undergraduate Studies. 4 s.h. Brehm and Staff

175, 176. Independent Research. Independent investigation of topics of special interest. Admission requires formulation of a study plan with a faculty supervisor and approval of the Director of Undergraduate Studies. Prerequisite: 9 s.h. of Psychology. 6-12 s.h. Brehm and Staff

191, 192, Independent Study and Research-I. Directed reading and

research. Open only to highly qualified students in the junior year, by permission of the department. See page 56. 6 s.h. Brehm and Staff

193, 194. Independent Study and Research-II. Directed reading and research. Open only to highly qualified students in the senior year, by permission of the department. See page 56. 6-12 s.h. Brehm and Staff

The following courses are open to selected undergraduates with per-

mission of the instructor:

203. Psychology of Perception. An examination of current systematic formulations with emphasis upon the intensive analysis of a variety of representative investigations. 3 s.h. Lockhead

204. Comparative Psychology. The study of behavior as related to species and of speciation as dependent upon behavior; instinct, imprinting

and learning at different phylogenetic levels. 3 s.h.

205. Interpersonal Processes. Determinants of attraction and hostility between persons and cognitive processes in relation to social interaction. Experimental derivations from cognitive consistency theories and exchange theories will be extensively discussed. Prerequisite: Psychology 101. 3 s.h. Linder

210. Cognition and Higher Mental Processes. An intensive analysis of the literature on thinking, problem solving, creativity, language, and related topics. Emphasis is upon the functional significance of these aspects of intellectual activity and upon the experimental methodology involved in their study. 3 s.h. Staff

213, 214. Conditioning and Learning. A survey of the literature on classical and instrumental conditioning and other forms of simple learning. Emphasis is on classical conditioning in 213 and on instrumental behavior

Kimble and Guttman

215. Developmental Psychology. A consideration of selected research areas in child behavior and development, including personality, cognition, perception and learning. Prerequisite: special permission of the instructor. 3 s.h. Borstelmann

216. Biological Psychology. The methods of biology (as applied to psychology), especially in neurophysiology, neuroanatomy, and genetics. Topics covered include: (a) the genetics of behavior, (b) the organization of the dorsal thalamus and neocortex, (c) the limbic system and hypothalamus. Methods covered include: (a) ablation method, (b) method of evoked potential, (c) electrical stimulation of the brain, (d)

classical and physiological genetics. 3 s.h. Diamond 217. Research Methods in Social Psychology. Presents the theory and

practice of data collection methods in social psychology. Emphasis is on the interplay between design and technique. The methods covered include formal scaling procedures, systematic observational techniques and others appropriate to field studies, field experiments, surveys and

laboratory experiments. 3 s.h. Brehm and Linder

218. Social Psychology. An examination of selected problem areas in social psychology including social factors in cognition, models of social interaction, conformity and social influence, and attitude development and change. Recent research is emphasized in relation to its historical context and its bearing on the development of theory. 3 s.h. Jones

220. Physiological Bases of Behavior. Classical studies on the neuropsychology of learning and behaviors such as hunger, thirst and sex. The central role of neuroendocrinology in the physiological bases of motivated

behavior. 3 s.h. Staff

225. Personality and Experimental Dynamics. Application of experimental methods to the study of psychodynamics, personality development and behavior pathology. Stress is on research in early experience and its influence on personality, frustration, conflict, anxiety, and the mechanisms of defense and adaptation. 3 s.h. Staff

234. Seminar in Personality. Selected research topics of current interest in experimental study of personality, including risk-taking, creativity, and

cognitive styles. 3 s.h. Wallach

236. Theoretical Psychology. Survey of representative systematic formulations and schools in historical sequence. Study of relationships between various philosophical, scientific, and cultural thought-patterns and the forms of psychological theories. 3 s.h. H. Crovitz

237. Functional Neurophysiology. Considers the mechanisms of activity of the individual neuron and groups of nerve cells, the principles of activity of the afferent and efferent neural systems, and the integrative and associative functions of the nervous systems. Laboratory demonstrations and participation. Permission of the instructor. 3 s.h.

238. The Electroencephalogram and Psychological Function. A survey of experimental and clinical literature on brain wave correlates of intelligence, personality, behavior disorders, epilepsy, sleep, sensory stimulation, reaction time, and attention. Special emphasis is placed on the electrophysiology of conditioning and learning. Lectures, laboratory

demonstrations and clinical case presentations. 3 s.h.

239. Behavioral Correlates of Brain Damage in Man. Effects of brain damage on psychological functioning. Known brain-behavior relationships and problems encountered in the study of brain function. Laboratory demonstrations for assessment of cerebral dysfunction through the

use of standard psychological tests. 3 s.h. Thompson

245, 246. Personality Theory and Assessment. An examination of representative models of human functioning from Freud to the present day. Included are examples from psychoanalytical, field theoretical and behavioristic approaches. Laboratory sessions will be concerned with personality assessment of normal human subjects over time. Interview and testing procedures will be introduced and the data gathered assessed against the theoretical models studied. 6 s.h. Alexander, Kremen, and

Schiffman

265. Fundamental Statistical Applications in Psychological Research. Introduction to probability and the use of statistics in description and hypothesis testing in psychology including the following applications: correlational techniques, chi-square and t tests, distribution-free tests and one-way analysis of variance. Prerequisite: Psychology 117-118 or equivalent. 3 s.h. Boneau

266. Advanced Statistical Applications in Psychological Research. The basic theory and application of analysis of variance techniques to complex experimental designs will be covered. Additional advanced techniques, including factor analysis, will be introduced. Prerequisite: Psychology

265 or equivalent. 3 s.h. Boneau

292. History of Psychology. The history of psychology, particularly in the experimental period of the past century and of its involvement in biology since Darwin. 3 s.h. Adams and Diamond

Departmental Major

Prerequisite. Psychology 91 or equivalent.

Major Requirements. 24 semester hours in psychology, including Psychology 91, 117, and a minimum of two courses numbered above 140.

Related Work. 18 semester hours which may include certain courses in chemistry, economics, education, English, linguistics, mathematics, philosophy, physics, political science, sociology-anthropology and zoology for the A.B. degree. For the B.S. degree, all 18 s.h. must be in the natural sciences.

Religion

Associate Professor Langford, Chairman; Associate Professor Phillips Director of Undergraduate Studies; Associate Professor McCollough, Supervisor of Freshman Instruction; Professor Price; Visiting Professor Murphy; Associate Professors Bradley, Clark, Jones, Osborn, Sullivan, and Wintermute; Assistant Professors Daniels, Fousek, Kort, and Partin; Visiting Assistant Professors Jenks and Ricketts; Instructor Pearson

The purpose of the undergraduate program of instruction in religion is to engage the student in a study of religion, its nature and historical manifestations. Since the Judaeo-Christian tradition is the dominant religious influence in the history of Western culture, an historical-critical examination of its primary sources, Old and New Testaments, is the basis of the required study in religion.

The department sees its task as integral to that of a liberal education. The inclusion of the study of religion in the university recognizes the integrity of the subject matter and its essential relation to the other humanities. It serves the cause of humanistic education furthermore by keeping alive fundamental and ultimate questions which are inherent in its subject matter and which can be engaged responsibly in the academic study of religion.

Students who have fulfilled the uniform course requirement in religion

may take only courses numbered 100 and above.

1-2. The English Bible. A comprehensive survey of the books of the Old and New Testaments. The literature is examined in the light of its origin in the history and religion of the people of the Bible, in order that its theological significance in its own day and in ours may be understood. Open only to freshmen. 6 s.h. Staff

43, 44. Tutorial. See description of Religion 1-2 which must accom-

pany the Tutorial. 1 s.h. each semester. Staff

51-52. The English Bible. A survey of the Old and New Testaments, similar to Religion 1-2 but adapted to the capabilities of sophomores, juniors, and seniors. Not open to freshmen, or to students who have

received credit for Religion 1-2. 6 s.h. Staff

55. The Religion of the Bible. An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen, or to students who have received credit for Religion 1-2 or 51-52. 3 s.h. Staff

65. Jesus: The Man and His Message. A detailed examination of the Gospel records, for the purpose of recovering the person and mission of Jesus. Attention will be given to conceptions of Christ in the history of the Church, and to his contemporary significance. Prerequisite: Religion 55. Not open to students who have completed the uniform course require-

ments in religion. See Religion 121. 3 s.h. Staff

85. Introduction to Christian Ethics. An analysis of the Biblical and theological bases for an understanding of man's moral situation, with a study of the social implications of Christianity in selected problem areas. Prerequisite: Religion 55. Not open to students who have completed the uniform course requirements in religion. See Religion 152. 3 s.h. Clark and McCollough

93. Survey of the World's Living Religions. An introductory course designed to acquaint the student with the problems and methods of the study of world religions. After a brief consideration of religion in primitive culture, the world's living religions are dealt with in terms of historical development and the beliefs, practices, and contemporary importance of each. Prerequisite: Religion 55. Not open to students who have com-

pleted the uniform course requirements in religion. See Religion 175.

3 s.h. Bradley, Partin, Ricketts, Sullivan

100. Principles of Investigation. An introduction to the resources and methods appropriate to advanced study in Religion. Required of all majors; open to others. 1 s.h. Wintermute

105. The Religion of the Bible. The historical and critical study of the Old and New Testaments: the principal persons, events, ideas, and practices in the Biblical record, and their significance for the present time.

3 s.h. Staff

111. The Prophets of the Old Testament. A study of the origin and rise of the prophetic movements, the message of the prophets in their historical setting, the contributions of this movement to the Biblical view of God and history, and the significance of the prophets for today. 3 s.h. Murphy and Wintermute

121. The Mission and Message of Jesus. An analysis and interpretation of the Gospels, designed to afford the student a fuller understanding of Jesus and his mission. Not open to students who have received credit for

Religion 65. 3 s.h. Daniels and Price

123. The Life and Letters of Paul. A study of the available sources for the life of Paul, his role in the expansion of the Christian movement, the most important aspects of his thought, and his continuing influence. 3 s.h. Daniels

131, 132. History of the Christian Church Through the Reformation. A study of the crucial events, issues, forms, and writings that have shaped the Christian community and civilization from the time of the early Church to the beginnings of the modern Church, intended to orient the student in the heritage and foundations of the Christian Church and of Western society. The first semester will deal with the ancient Church through the sixth century; the second semester with the medieval and Reformation developments. 3 s.h. each semester. Fousek

133. History of Christianity Since the Reformation. A study of events, trends, personalities, and interpretations which have shaped Christianity since the Reformation, with emphasis upon those which contribute to an

understanding of the contemporary religious situation. 3 s.h.

135. The Correspondence of the Great Fathers of the Church. A seminar in theological discussions, personalities, issues of the day, in the context of later Roman society, seen through the letters of the Fathers from Athanasius to Gregory the Great. Prerequisite: Religion 131, or permission of instructor. 3 s.h. Fousek

137. Christianity in America. A study of representative men, movements, and thought in American Christianity to 1918. 3 s.h. Jones

138. Contemporary Religions in the United States. Judaism, Catholicism, and Protestantism are studied with reference to their distinctive be-

liefs and practices. A comparison is made of common and dissimilar features. 3 s.h. *Phillips*

140. Christian Beliefs. An introductory study of important Christian teachings concerning God, Jesus Christ, sin and salvation, etc., intended to serve as a basis for the student's evaluation of his own religious concepts. 3 s.h. Langford

144. Problems of Religious Thought. A study of the relation of belief in God to various other types of knowledge and experience, such as the research of natural and social scientists and the facts of suffering, human

tragedy, and evil. 3 s.h. Langford

149. Current Interpretations of Christianity. Contemporary types of Christian thought as seen through the writings of such leading representatives as Karl Barth, John Baillie, Paul Tillich, and Reinhold Niebuhr.

3 s.h. Osborn

152. Christian Ethics. A systematic study of the ethical implications of Biblical religion. Attention is given both to the historical development of the Christian ethic and to the responsibility of the Christian in the various aspects of contemporary social life, such as marriage, the state, race, etc. Not open to students who have received credit for Religion 85. 3 s.h. Clark and McCollough

154. Ethics and Modern Technology. Emerging ethical issues created by the impact of technology on the psychological, social, political, and

economic life of modern man. 3 s.h. Clark

156. Christian Marriage and the Family. Marriage and the family in American society studied from the Christian perspective. Attention will be given to the teachings of the churches and of psychologists and sociologists concerning courtship and marriage, sex, parent-child relationships, mixed marriages, and divorce. 3 s.h. *Phillips*

171. Religions of the Ancient Near East. The history and literature of religions in the cultures of Egypt, Mesopotamia, Persia, and Palestine from

earliest times to 600 B.C. 3 s.h. Wintermute

172. Religious Quests of the Greco-Roman World. The religious movements in the Hellenistic age, including sectarian Judaism, Persian dualism,

the mystery cults, and Gnosticism. 3 s.h. Wintermute

175. Non-Christian Religions of the Modern World. An examination of the beliefs of Islam and the religions of India, China, and Japan. Emphasis will be placed upon the sacred literature, world view, history, and cultural and social significance of the principal non-Christian religions. Not open to students who have received credit for Religion 93. 3 s.h. Bradley, Sullivan, and Partin

176. World Religions and Social Change. Religious traditions and institutions in national and international affairs. Intensive study of selected areas of Asia and Africa with special stress on missionary religions and

political change. 3 s.h. Bradley

178. Myth and Symbol. Historical and phenomenological study of religious myth and symbol, Christian and non-Christian. The nature and function of myth in religion; types of myths, with particular attention to cosmogonic myths. The nature of religious symbols; structural and comparative study of selected symbols. 3 s.h. Partin

179. Mysticism: Sacred and Profane. Varieties of mystical experience, both religious and non-religious; representative mystics in Hinduism, Islam, Christianity, and Mahayana Buddhism; the nature and significance of mysticism within these traditions. Prerequisite: Religion 93 or 175.

3 s.h. Sullivan

187. Religious Values in Classical and European Literature. A consideration of the religious insights, explicit and implied, in representative writings. 3 s.h. Kort

189. Man in Modern Prophetic Thought. The individual and society in the writings of Kierkegaard, Nietzsche, and Berdyaev. 3 s.h. McCol-

lough

191, 192. Independent Study. Directed reading and research. Open only to highly qualified students in the junior year, by permission of the department. 6 s.h. See page 56.

193, 194. Independent Study. Directed reading and research. Open only to highly qualified students in the senior year, by permission of the

department. 6-12 s.h. See page 56.

195-196. Honors Research. The first semester is a seminar in which methods of research are applied to selected problems in religion; in the second semester, independent research projects are reported to the class, and eventuate in research papers. Normally taken in the junior year. 6 s.h. Staff

Senior Seminars

The following seminars parallel the five categories of courses offered in the department. They afford opportunities for more intensive reading and individual research. Each major must take one of these courses in his senior year; they are open also to qualified non-majors. To be eligible for a seminar the student (major or non-major) must have completed at least one course in this area or pass the qualifying examination on the departmental reading list in that category. Each seminar will be offered as frequently as student demand and available personnel permit.

199. (See University Course).

203. Biblical Studies. 3 s.h.

204. Church History. 3 s.h.

205. Theology and Ethics. 3 s.h.

206. Christianity and Culture. 3 s.h.

207. History of Religions. 3 s.h.

For Seniors and Graduates

210. Contemporary British Theology. Selected problems in representative British theological writings after (1900.) Prerequisite: permis-

sion of the instructor. 3 s.h. Langford

228. The Theology of the Gospel and the Epistles of John. A study of the origin of these writings, the provenance of their thought forms and symbolism, their influence on the early Church, and their contemporary significance. Prerequisite: permission of the instructor. 3 s.h. Price

248. The Theology of Karl Barth. An historical and critical study of the theology of Karl Barth. Prerequisite: permission of the instructor.

3 s.h. Osborn

279. Religions of East Asia. Major traditions of China and Japan with emphasis upon the development and expansion of Buddhism. Prerequi-

site: permission of the instructor. 3 s.h. Sullivan

285. Origins of Indian Civilization. A study of the main sources and traditions of the classical civilization of the Indian subcontinent with particular attention to religious movements and institutions. (Also listed as History 285.) Prerequisite: permission of the instructor. 3 s.h. Sullivan

Departmental Major

Prerequisite. Completion of the uniform course requirement in religion. (The sequence Religion 1-2 or 51-52 is recommended.)

Major Requirements. Twenty-five semester hours selected as follows:

- 1. Religion 100 (to be taken in the semester after becoming a major).
- 2. Three hours from each of the following categories: (A major may fulfil, without credit, the requirement in any one of these areas by passing the departmental examination of the basic book list for that category).

(a) Biblical studies: 111, 121, 123, 228

(b) Church history: 131, 132, 133, 137, 138

(c) Theology and ethics: 140, 149, 152, 154, 156, 210, 248

(d) Christianity and culture: 144, 187, 189

- (e) History of religions: 171, 172, 175, 176, 178, 279
- 3. A three hour senior seminar in one of the five categories.
- 4. At least six hours elected from the departmental curriculum.

Related Work. Eighteen semester hours, including a minimum of six hours in each of two departments. There is no restriction in principle as to departments in which related work may be taken. The departmental major adviser will take into consideration the vocational objective of the student and the need to select courses which will strengthen his major work.

The Department offers work leading to graduation with distinction

which is normally begun in the junior year. See the section on graduation with distinction in this *Bulletin*.

Romance Languages

Professor Fein, Chairman; Associate Professor Grant, Director of Undergraduate Studies in French; Professor Davis, Director of Undergraduate Studies in Spanish; Associate Professor Hull, Supervisor of Language Instruction; Professors Cherpack, Dow, Fowlie, Predmore and Wardropper; Associate Professors Cordle, Herrero, Tétel, Torre, and Vincent; Assistant Professors Barlow, Dow, Hogsett, Miller, Périvier, and Ripley; Instructors Bryan, Cox, and Tate; Balentine, Bowman, Carey, Cid, Daniel, Glenn, Goode, Grant, Humphrey, Lockwood, Marras, Morganroth, O'Keefe, Stamelman, Vines, and Wright

French 63-64 and Spanish 63-64 are the prerequisites for all elective courses. Students who, by reason of foreign residence, have had special opportunities in French or Spanish must be classified by the Director of Undergraduate Studies.

French

1-2. Elementary French. Introduction to understanding, speaking, reading, and writing French. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 8 s.h. (E & W) Hull and Staff

63-64. Intermediate French. Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: French 1-2 or placement test. 8 s.h. (E & W) Vincent and

Staff

91, 92. Introduction to French Literature. An introduction to the major writers of the French literary tradition. Selections and complete works of poetry, fiction, theater, and essay. In the first semester: Middle Ages through the 18th century. In the second semester: 19th and 20th centuries. Lectures and discussions; short essays and tests. Conducted in French. Prerequisite: French 63-64 or equivalent. 6 s.h. (E & W) Cordle and Staff

97. Spoken French. Intensive instruction in the spoken language: contemporary French prose provides the basis for vocabulary building, and for practice in structural patterns. Does not satisfy the minimum uniform requirement. Limited to 15 students. Prerequisite: French 64. 3 s.h. (E)

Dow and Staff

100. Masterworks of French Literature. An intensive study of selected works of French Literature with special emphasis on developing critical

techniques. Open only to Freshmen, through the Advanced Placement Program or by invitation of the department. 3 s.h. (E) Hogsett

104. The Sixteenth Century. An introduction to the spirit of the French Renaissance as reflected in the literature of the age of Rabelais and Montaigne, Ronsard and Du Bellay. 3 s.h. (E) Vincent

105. Explication De Textes. A study of the French method of textual analysis, with selections primarily from the 19th and 20th century authors.

For students who have taken 91 and 92. 3 s.h. Fowlie

106. The Worlds of Rousseau. Studies of Rousseau's conception of the real world (the Discours), the ideal world (Émile and the Contrat Social), the fictional world (La Nouvelle Héloïse), and his personal world (the Confessions and the Rêveries). 3 s.h. (E) Cherpack

107. The Worlds of Voltaire. Studies of Voltaire's conception of the real world (historical, philosophical, and satirical writings), his aesthetic world (poetry, drama, criticism), and his personal world (correspon-

dence). 3 s.h. (E) Cherpack

108. French Romanticism. The beginnings of the modern era, in its quest for new values and a new expression, as studied through the great lyric poets and prosodists of the first half of the nineteenth century. Readings from Chateaubriand, Lamartine, Musset, Hugo, Vigny and others. 3 s.h. (E) Grant and Ripley

109. Toward Modernism in French Poetry. An introduction to modern trends in the nineteenth century: emergence from traditional Romanticism; Art for Art's Sake and the Parnassians (Gautier, Leconte de Lisle); the transition from Decadence to Symbolism (Baudelaire, Verlaine, Rim-

baud, and Mallarmé). 3 s.h. (E) Barlow

111. French Drama of the Nineteenth Century. A survey of the French theatre from the Romantic period to the Théâtre libre. 3 s.h. (E) Dow

112. French Drama of the Twentieth Century. Reading of representative plays selected from the works of Bernstein, Maeterlinck, Romains, Sarment, Vildrac, J.-J. Bernard, Claudel, Lenormand, Pagnol, Giraudoux, Anouilh, and others. 3 s.h. (E) Dow

113. The Seventeenth Century. The search for man and for form; with special emphasis on the theater and the moralists. 3 s.h. (E) Périvier.

114. Diderot. Diderot as critic, philosopher, and novelist; his techniques of paradox, dialogue, and "cas-limite"; his role in the publication of the *Encyclopédie*. 3 s.h. (E) Hogsett

115. The Nineteenth Century Novel. Intensive study of selected novels from the works of Stendhal, Balzac, Flaubert, and Zola. Not open to

students taking French 221 or 222. 3 s.h. (E) Grant

127. Advanced Composition and Conversation. A systematic review of grammar; frequent oral and written reports. Attention to problems of pronunciation and diction. Prerequisite: 97 or consent of the instructor. 3 s.h. (E) Mrs. Bryan, Mrs. Dow

134. Contemporary French Life and Thought. An introduction to the essential currents in French thought since 1895. Representative literary works are used as a basis for analysis and discussion of the contemporary scene. 3 s.h. (w) Cordle

191, 192. Independent Study. Directed reading and research. Open only to highly qualified juniors by permission of the Department. See

page 56. 6 s.h.

193, 194. Independent Study. Directed reading and research. Open only to highly qualified seniors by permission of the Department. See page 56. 6 s.h.

209. Advanced Composition and Syntax. A detailed study of the morphological and syntactic structure of the French language; practice in writing various styles of French; vocabulary study. 3 s.h. (w) Hull

210. French Phonetics. The phonemic structure of contemporary French. Sounds, intonation. Practice in transcription. Remedial pronunciation drills. Readings on current phonological theory, especially as applied to French. 3 s.h. (w) Hull

213. French Literature of the Seventeenth Century. Its initial phase. Readings in the major literary works to the middle of the century. 3 s.h.

(w) Cherpack

214. French Literature of the Seventeenth Century. Its "classical" phase. Readings in the major literary works from the middle to the end of the century. 3 s.h. (w) Cherpack

217. Mallarmé and Rimbaud. The symbolism and the formal elements of Mallarmé's poetry. The poetic theory and the psychic elements in

Rimbaud's poetry. 3 s.h. Fowlie

219. Old French Literature. An introduction to the reading of medieval

French literary texts. 3 s.h. (w) Vincent

- 221. The Nineteenth Century French Novel. The initial phase. The Romantic hero in conflict with society, with special emphasis on the works of Stendhal and Balzac. 3 s.h. (w) Grant
- 222. The Nineteenth Century French Novel. A continuation of 221. The decline of the individual hero. Flaubert and Zola will receive intensive study. 3 s.h. (w) Grant
- 223. French Literary Criticism. A history of critical theory in France and a study of the major critics from the Renaissance to today. 3 s.h. Fowlie
- 225, 226. From Renaissance to Baroque in French Literature of the Sixteenth Century. First semester: literary prose. Readings from Jean Lemaire de Belges, Marguerite de Navarre, Rabelais, Montaigne, and others. Second semester: poetry and theater. Readings from Marot, Scève, Labé, Saint Gelais, the Pléiade, d'Aubigné, Sponde, Du Bartas, Garnier, and others. 6 s.h. (w) Tétel

228. French Poetry of the Twentieth Century. In the wake of symbol-

ism: Valéry and Claudel; poetry as ritual: Péguy; Apollinaire and surrealist poetry; the contemporary movement: Michaux, Char, Saint-John Perse. 3 s.h. Fowlie

233. Contemporary French Theatre. A study of dramatic theory; the art of the leading directors; and the major texts of Claudel, Giraudoux,

Anouilh, Sartre, Beckett, Ionesco, Genet, etc. 3 s.h. Fowlie

234. Proust. A study of A la recherche du temps perdu. The thematic structure and the aesthetics of the work. This course is designed for graduates, but may be taken by qualified seniors and by a limited number of juniors with the permission of the instructor. 3 s.h. Fowlie

236. Baudelaire. A study of the poetry and criticism of Baudelaire as contributing to the origins of modern art and literature. 3 s.h. (w)

Fowlie

241, 242. French Literature and Thought in the Age of Enlightenment. First semester: The new philosophy and its propagation. Lectures and discussions involving texts by Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and others. Second semester: the crisis in literary aesthetics. Readings, lectures, and discussions bearing on the clash between Classicism and new literary orientations. 6 s.h. (w) Cherpack

245. French Literature of the Twentieth Century. To 1935. Emphasis

on Gide, Mauriac, and Malraux. 3 s.h. (w) Cordle.

246. French Literature of the Twentieth Century. After 1935. Emphasis on Sartre, Camus, and the nouveau roman. 3 s.h. (w) Cordle

Italian

181-182. Italian. Intensive introduction to the language. Modern readings. Completion of the second college year of another foreign language will normally be required as a prerequisite. 6 s.h. (E) Tétel

288. The Renaissance. Petrarch, Boccaccio and Ariosto. 3 s.h. (w)

Tétel

Portuguese

181-182. Portuguese. Intensive introduction to the language. Modern readings. Completion of the second year of another foreign language will normally be required as a prerequisite. 6 s.h. (w) Miller

185, 186. Conversation. Intensive practice in spoken Brazilian Portuguese. Prerequisite: Portuguese 181-182 or permission of the instructor.

1 s.h. (w) Miller

Spanish

1-2. Elementary Spanish. Introduction to understanding, speaking, reading, and writing Spanish. Audio-lingual techniques are combined

with required recording-listening practice in the language laboratory. 8 s.h. (E & W) Miller and Staff

63-64. Intermediate Spanish. Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: Spanish 1-2 or placement test. 8 s.h. (E & W) Davis

- 91, 92. Introduction to Spanish Literature. An introduction to the major writers of the Spanish literary tradition. Selections and complete works of poetry, fiction, theater, and essay. In the first semester: Middle Ages through the 18th centuries. In the second semester: 19th and 20th centuries. Lectures and discussions; short essays and tests. Conducted in Spanish. Prerequisite: Spanish 63-64 or equivalent. 6 s.h. Davis and Staff
- 97. Spoken Spanish. Intensive instruction in the spoken language: contemporary Spanish prose provides the basis for vocabulary building, and for practice in structural patterns. Does not satisfy the minimum uniform requirement. Limited to 15 students. Prerequisite: Spanish 64. 3 s.h. (E) Staff
- 156. Representative Writers of Spanish American Literature. Study of works which are examples of the principal literary currents after 1880. 3 s.h. (w) Fein
- 161. Spanish Literature of the Renaissance and the Baroque. A study of selected works of the sixteenth and seventeenth centuries with attention to their reflection of social, religious, and political ideas. 3 s.h. (E) Miller
- 162. Spanish Romanticism. A study of the romantic spirit in modern Spanish literature. 3 s.h. (E) Torre

163. The Generation of 1898. A study of the "Spirit of 1898" with special emphasis on the novel and essay. The precursors: "Clarín" and Ganivet; Unamuno, Baroja, "Azorín," Valle-Inclán; influence on the next generation: Pérez de Ayala and Ortega y Gasset. 3 s.h. (w) Herrero

165. Analysis of Great Spanish Authors. A close textual study of a few literary texts with some considerations of methods of literary criticism. The course is designed to give the student insight into various ways of interpreting and understanding literary works so that his experience of literature in general may be enriched. 3 s.h. (E) Wardropper

166. Spanish Realism. The growth of realism in Spanish literature of

the nineteenth century. 3 s.h. (w) Davis

176. Advanced Conversation. This course is designed to develop facility of expression through constant drill on vocabulary and conversational idiom. Time will be devoted to a review of the essentials of Spanish syntax. Prerequisite: Spanish 97 or permission of the instructor. 3 s.h. (w) Herrero

191, 192. Independent Study. Directed reading and research. Open

only to highly qualified juniors by permission of the Department. See page 56. 6 s.h.

193, 194. Independent Study. Directed reading and research. Open only to highly qualified seniors by permission of the Department. See

page 56. 6 s.h.

251. The Origins of the Spanish Novel. A critical study, based on close readings and discussions, of selected examples of the principal genres of the early novel: Amadis de Gaula, Diego de San Pedro's La cárcel de amor, the Abencerraje, the Lazarillo, Montemayor's Diana. 3 s.h. (w) Wardropper

252. Spanish Lyric Poetry Before 1700. A critical study, based on close reading and discussion, of selected poems of the Middle Ages, Renaissance and Baroque. Special emphasis on the Razón de amor, la poesía de tipo tradicional, and Santillana; on Garcilaso, San Juan de la Cruz, Fray Luis de León, and Herrera; on Góngora and Quevedo. 3 s.h. (w)

Wardropper

253. The Origins of the Spanish Theater. A study of the evolution of the Spanish theater from the Auto de los Reyes Magos (12th century) through the end of the 16th century. The idea of the theater as dramatic poetry will be stressed; close reading of texts by Gómez Manrique, Encina, Gil Vicente, Torres, Naharro, Lope de Rueda, Juan de la Cueva. 3 s.h. (w) Wardropper

255. Modern Latin American Literature. The coming of age of Latin American literature in the nineteenth and twentieth centuries, with particular attention to the Modernist movement. 3 s.h. (w) Fein

256. Contemporary Latin American Literature. Trends in Latin American literature after the Modernist movement. Analysis of significant works in various genres. 3 s.h. (w) Fein

258. Old Spanish Literature. An introduction to the reading of medi-

eval Spanish literary texts. 3 s.h. (w) Davis

259. Spanish Phonetics. A phonemic approach to the study of Spanish sounds. Remedial pronunciation drills with special emphasis on rhythm and intonation. Readings in current studies of phonology. Prerequisite:

Spanish 176 or permission. 3 s.h. (w) Predmore

260. Advanced Composition and Syntax. Study of fundamental difficulties in the language; practice in writing idiomatic Spanish; exercises in free composition. For students who have a satisfactory command of Spanish grammar and fair conversational ability. Prerequisites: Spanish 176 or permission. 3 s.h. (w) Herrero

261. Nineteenth Century Novel. A study of literary trends in the last half of the nineteenth century. Readings will be selected from the novels of Valera, Pereda, Galdós, Pardo Bazán, Blasco Ibáñez, and their con-

temporaries. 3 s.h. (w) Davis

262. Romanticism in Spain. The origin and evolution of Romanticism

from its earliest manifestations in the Eighteenth Century to Becquer.

Emphasis on poetry and drama. 3 s.h. Herrero

265. Golden Age Literature: Cervantes. The life and thought of Cervantes with special emphasis on his Quijote. 3 s.h. (w) Predmore and Wardropper

266. Golden Age Literature: The Drama. A study of the chief Spanish dramatists of the seventeenth century with readings of representative

plays of this period. 3 s.h. (w) Wardropper

275. Contemporary Spanish Literature: Essay and Lyric Poetry. A study of the revision of national values and literary expression in the twentieth century with particular reference to the crisis of 1898 and to the enrichment of the Spanish tradition through extrapeninsular influences. 3 s.h. (w) Predmore and Herrero

276. Contemporary Spanish Literature: Novel. A study of tradition and innovation in the twentieth century Spanish novel with emphasis on the novels of Unamuno, Baroja, Valle Inclán, and Pérez de Ayala. 3 s.h.

(w) Predmore and Herrero

Romance Languages

RL 211. Approaches to Romance Literature. An introduction to the most significant ways in which Romance Literature has been divided and

studied, with analyses of selected texts. 3 s.h. (w) Cherpack

RL 218. The Teaching of Romance Languages. Evaluation of objectives and methods; a study of the practical problems involved in teaching these languages on the elementary, secondary, and college level; analysis of textbooks, special foreign language programs, audio-visual aids; critical examination of modern techniques in written and oral testing. 3 s.h. (E) Dow

RL 224. Romance Linguistics. The origin and development of the Romance languages from spoken Latin to the modern standard languages and local dialects. Introduction to the structural method as applied to historical and comparative linguistics. Prerequisite: French 219, Spanish 258, or permission of instructor. 3 s.h. (w) Hull

Departmental Major

Prerequisites. French or Spanish: 63-64 or equivalent.

Major Requirements. For French: 97; 127; 209 or 210; and a minimum of 15 hours of courses in literature selected from 91 and above. All majors must take one of the following: 113, 213, 214. For Spanish: 97; 176; 259 or 260; and a minimum of 15 hours of courses in literature selected from 91 and above including six hours above 200. All majors must take one of the following: 161, 251, 252, 253, 265, 266.

The Department offers work in the junior and senior years leading to graduation with distinction. See the section on Honors in this *Bulletin*.

Related Work. Majors in Romance Languages will select, with approval of the Director of Undergraduate Studies, appropriate courses from the following fields: (1) other languages and literature; (2) history; (3) philosophy; (4) appreciation courses in music and art; (5) linguistics; and occasionally from other fields deemed suitable.

Russian

For courses in Russian, see Slavic Languages and Literature.

Slavic Languages and Literatures

Associate Professor Krynski, *Chairman*; Associate Professor Jezierski; Assistant Professors M. Pavlov, H. Pavlov, Hankin and Apte; Lecturer, Swan

1-2. Elementary Russian. Introduction to understanding, speaking, reading and writing. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 8 s.h. (w) Staff

63-64. Intermediate Russian. Intensive classroom and laboratory practice in spoken and written patterns. Reading in contemporary literature. Prerequisite: Russian 1-2, or two years of high school Russian. 8 s.h.

Staff

91-92. Advanced Russian. Systematic study of syntax and style in the written and spoken language. Readings of nineteenth and twentieth century authors. Oral and written reports. Conducted in Russian. Pre-

requisite: Russian 63-64, or equivalent. 6 s.h. (w) Pavlov

97, 98. Spoken Russian. Intensive instruction in the spoken language: contemporary Russian prose provides the basis for vocabulary building, and for practice in structural patterns. Does not satisfy the minimum uniform requirement. Limited to 15 students. Prerequisite: Russian 92. 3 s.h. M. Pavlov

101, 102. Russian Literature and Culture Through the Nineteenth Century. Russian prose, poetry and criticism, with special attention to recent periods. Readings (from The Igor Tale to Blok) in English.

Lectures and class discussion. 6 s.h. (w) Jezierski

103. Soviet Literature and Culture. Literature since 1917, as a continuation of nineteenth-century traditions and as a response to Soviet ideology. Readings (in English or Russian) from major works of prose, poetry and drama. 3 s.h. (w) Jezierski

105. The Russian Theatre and Drama. Russian drama from its beginnings to the present. Lectures, class, discussions, readings of plays in

English or Russian. 3 s.h. (w) Jezierski

179. 20th Century Russian Prose. Modern prose in the original. Textual analysis of Russian prose since the turn of the century. Offered every year. Prerequisite: Russian 1, 2, 63, 64, or instructor's permission. 3 s.h. Fall Semester. Krynski

180. Masterpieces of Russian Literature of the 19th Century. Poems, plays and prose by such authors as Pushkin, Turgenev and Chekhov in the original. Offered in 1968-69 and subsequently in alternate years. Prerequisite: Russian 1, 2, 63, 64 or instructor's permission. 3 s.h. Krynski

181. Modern Russian Poetry. The historical development of modern Russian poetry, metrics, prosody, and versification. Representative works of major recent Russian poets Blok, Axmatova, Pasternak, and Voznesensky. Prerequisite: at least three semesters of Russian, or instructor's consent. 3 s.h. (w) Fall semester. Jezierski

191, 192. Independent Study. Directed reading and research. Open only to highly qualified students by permission of the department. (See

page 38.) 6 s.h.

201, 202. The Novelists of Nineteenth Century Russia. Development of the Russian novel against the European background, with emphasis on Dostoevskij and Tolstoj. Extensive readings in English or Russian. Lectures, oral reports, class discussions and term paper. 6 s.h. (w) Iezierski

212. Pushkin. A survey of his life and works, with attention given to his role as a precursor of modern Russian literature. Prerequisite: Russian 101, or the instructor's permission. Readings in English or Russian.

3 s.h. (w) Jezierski

224. The Russian Short Story—18th Century to the Present. Such masters as Pushkin, Gogol, Turgenev, Tolstoy, Dostoevsky, Leskov, Chekhov, Gorky, Bunin, Andreyev, Babel, Zamiatin, Zoshchenko and Kazakov. Readings in English. Majors will do part of the reading in Russian. 3 s.h. Spring Semester. Krynski

227. Gogol. Life and works: short stories, dramas and the novel. Readings in English, but students knowing Russian will do part of the reading

in that language. 3 s.h. Jezierski

230. Chekhov. Chekhov as a short story writer and his influence on the 20th Century Western short story. Close structural analysis of the plays of one of the greatest dramatists of all time. 3 units. Krynski

232. Fyodor Dostoevsky. The major fiction of a leading 19th century

Russian writer. Spring semester. 3 s.h. Krynski

233. Ivan Turgenev. Novels, short stories and drama of the great exponent of classical realism. Fall semester. 3 s.h. Krynski

236. Russian and Polish Romanticism. Prose, poetry, drama of such

major writers as Pushkin, Lermontov, Mickiewicz and Krasinski against the background of the Romantic movement in Western Europe. Spring

semester. 3 s.h. Krynski

SL 204. Polish Literature of the 20th Century. Readings in English of Polish novels, plays and poems, from the beginning of the century through the sixties. Emphasis on the avant-garde works of the liberal period after 1955. 3 units. Krynski

Departmental Major

Prerequisite. Russian 1-2

Major Requirements. Russian 63-64 and 18 semester hours in the department including 91-92 and at least 6 semester hours of senior-graduate courses.

Related Work. 18 semester hours chosen with the approval of the department from the humanities, history and the social sciences.

Sociology and Anthropology

Professor McKinney, Chairman; Assistant Professor Farley, Director of Undergraduate Studies; Professors Back, Kerckhoff, La Barre, Maddox, and Thompson; Associate Professors Beidelman, McCormack, Marsh, Preiss, Rowe, Roy, Smith, Tiryakian, and Winsborough; Assistant Professors Apte, Bowers, Crocker, Prost

Sociology

Sociology 91 or 92, or the equivalent or special permission of the instructor or the Director of Undergraduate Studies, is a prerequisite for all sociology courses at the 100 and 200 levels.

91. Introduction to Sociology: Concepts and Procedures. Concepts and procedures of sociology and illustrations of their use in understanding specific areas of social life. 3 s.h. (E & W) Open to Freshmen. Staff

92. Introduction to Sociology: Sociological Studies. Application of theories and methods of sociology through an examination of several empirical studies dealing with various aspects of social behavior. 3 s.h. Open to Freshmen. (E & W) Staff

136. Sociology of Modern Africa. An introduction to the modernization of sub-Sahara Africa. Primary emphasis given to the nature and formation of colonial society, as well as to process of decolonization and

its sources. 3 s.h. (w) Tiryakian

139. Comparative Social Structure. Comparison of social phenomena in two or more societies. Sociological propositions, tested with American data and data from other societies. 3 s.h. (w) Marsh

141. Introduction to Population and Human Ecology. This course provides an introduction to two macroscopic aspects of society. Both the size, distribution and composition of populations, and the morphological aspects of collective life are considered. 3 s.h. (w) Winsborough and Farley

142. The Sociology of Mass Communication. An analysis of the role of radio, the press, magazines, movies and television in modern societies. An examination of the selective audiences, content characteristics, controlling elements, and organizational structure of the various media of mass com-

munication. 3 s.h. (w) Smith

143. Deviant Social Behavior. Analysis of deviant behavioral systems (illness, crime, delinquency, etc.) in terms of (a) precipitating social factors, (b) patterns and goals, (c) remedial and counter-acting controls. 3 s.h. (w) Preiss

145. Urban Sociology. Historical, demographic, and ecological materials are used to study urban society with respect to its institutions, interaction patterns, differentiation, integration, disorganization, and decen-

tralization. 3 s.h. (w) Smith and Farley

146. Industry and Society. A study of industrial institutions in their interrelationships with other forms of social behavior in the broad cultural setting of western civilization. Attention will center upon analysis of specific social problems resulting from the impact of industrial change. 3 s.h. (w) Roy

150. The Family. Analysis of the American family as an institutionalized group and its relationship with other institutions and structural features such as social class and ethnic group. Special attention is devoted to methods of research in this area. 3 s.h. (w) Kerckhoff and Roy

151. Sociology of Religion. The religious factor in society and the social factor in religion. Major sociological theories and selected research

studies. 3 s.h. (w) Tiryakian

- 153. Sociology of the South. The developing regional organization of the world economy studied with especial reference to Southern life. A survey of the composition and distribution of population, races and race relations. Primary emphasis is upon social change. 3 s.h. (w) Thompson
- 154. The Sociology of the Arts. An analysis of the social relations of the world of the arts (painting and sculpture, music, and literature) with emphasis upon creative artists, art publics, art organizations and art works as they function in their social-cultural milieux. 3 s.h. (w) Back
- 155. Introduction to Industrial Sociology. An analysis and appraisal of the various factors that affect human relations in industry. The interpersonal and intergroup relationships within the individual industrial unit which determine its efficiency as an economic and social institution

and the social conditions in the community as they affect social rela-

tions. 3 s.h. (w) Roy

159. The Negro in America. A study of the history and changing status of the Negro regarded as a symbol and protagonist of minority groups in

America and elsewhere. 3 s.h. (w) Thompson

172. Collective Behavior and Social Movements. Examination of disruptive and relatively unorganized aspects of social phenomena such as crowd behavior, fads, rumors, crazes and social movements as indexes of social disequilibrium and potential sources of social change. 3 s.h. (w) Kerckhoff

193. Independent Study. Directed reading and research. Required of candidates for graduation with distinction in the department. Open only to highly qualified students in the senior year, by permission of the depart-

ment. 3 s.h. (w) Staff

199. The Changing South. (See Interdisciplinary Course 199.)

241. Social Stratification. The nature of hierarchical and vertical differentiation in the economic, political and prestige structures in modern societies. The interrelationship of class, status and power strata and their influence on social institutions, personality structure, and group and individual behavior. 3 s.h. (w) Marsh and Roy

242. The Sociology of Occupations and Professions. The social significance of work. Analysis of forces changing the contemporary occupational structure, typical career patterns of professions and occupations, the social organization of occupational groups. 3 s.h. (w) McKinney

and Roy

243. Population Dynamics and Social Change. Introduction to demographic analysis. The relationship between the demographic structure of

society and its social organization. 3 s.h. (w) Winsborough

247. Community and Society. This course seeks to provide a frame of reference for the analysis and ordering of facts pertaining to the diverse cultures of the world, the State, the world community, the Great Society, and news, mass behavior, social problems, races and classes. 3 s.h. (w) Thompson

251. The Sociology of Modernization. Changes, obstacles to change, and structural strains which occur in kinship, stratification, bureaucracy and the role of the military, occupations and work, communications, values and ideologies, during modernization. Special reference to Asian societies, as h. (w). March

societies. 3 s.h. (w) Marsh

253. Social Institutions. The study of particular institutions and the social movements out of which they developed, with emphasis on the development of general propositions concerning the nature, function and importance of institutions in society. 3 s.h. (w) Thompson

255. Race and Culture. A comparative study of race relations in world perspective developed around such themes as race and personal identity,

the geography and ecology of race relations, the idea of race, and race

conflict. 3 s.h. (w) Thompson

259. Religion and Social Change. The role of religion in significant social changes in Western and non-Western societies: non-institutional phenomena (charisma, prophecy, messianism, revivals, glossolalia). Prerequisite: either Anthropology 264, Sociology 151, or the equivalent. 3 s.h. (w) Tiryakian

272. The Socialization Process. Universal societal requirement for continual replacement of socialized personnel. Variations in socialization by position in the social structure (class, caste, urban-rural, etc.) and contributions made by various socialization agencies (family, school, peer groups, mass media). Western society is the focus of study. 3 s.h. (w)

Kerckhoff

275. Social Attitudes and Individual Behavior. Such issues as the following are considered: the importance of symbolic interaction, the development of the "self," the social structuring of the socialization process, individual movement within the social structure, and the importance of membership groups and reference groups. 3 s.h. (w) Back and Kerckhoff

278. Social Structure and the Life Cycle. A study of the relationship between age as a social characteristic and social interaction, with particular reference to adolescence and old age. 3 s.h. (w) Maddox

282. Principles of Sociological Analysis. A systematic theoretical examination of the social order, focusing on its structural components and the

functions they serve. 3 s.h. (w) Thompson and McKinney

295. Methodology in Sociology. Considerations of the nature of scientific method, as well as alternative paths to knowledge, as they apply to sociology. Conceptualization, hypothesis formation, and definition. The research process as a decision-making situation both on the general level of research design and the specific level of special techniques. The process and logic of data analysis. Relations of theory and research are stressed. 3 s.h. (w) Smith and Back

297. Statistical Analysis in Sociology. Such techniques as zero and higher order linear and curvilinear correlation, partial correlation, analysis of variance and covariance and factorial design are studied. When possible, analogous nonparametric techniques are also considered. Prerequisite: Mathematics 233 or an equivalent course or permission of the instructor. 3 s.h. (w) Winsborough and Farley

Departmental Major in Sociology

Major Requirements. Twenty-four semester hours of work in Sociology including either or both Sociology 91 and 92 and at least six semester hours in the Senior-Graduate courses.

Related Work. A minimum of eighteen semester hours, at least twelve of which are normally chosen from two of the following fields: economics, education, history, mathematics, political science, and psychology. Additional courses in other fields may also be elected as related work when indicated by the educational requirements of the student and approved by the Departmental adviser.

Anthropology

93. General Anthropology. Origins and distribution of mankind; a survey of human paleontology and human biology, world archaeology, prehistory and languages; and the origins of human social organization and culture. 3 s.h. (w) Staff

94. Cultural Anthropology. A study of the dynamics of culture and society; form and function of social institutions. Emphasis is upon primi-

tive societies. 3 s.h. (w) Staff

101, 102. Introduction to the Civilizations of Southern Asia. (See Inter-

disciplinary Course 101, 102.)

121, 122. World Ethnography. The major cultural areas of the world in terms of the "universal culture pattern." Ethnographic records are used to illustrate and appraise non-Western man's environment. 3 s.h. (w) Staff

124. Peoples of the World: American Indian. A comprehensive survey of the Indians of North and South America, including a study of origins and prehistory, archaeology, racial affiliations, languages, material culture, social and political organization, economics and religion, discussed in terms of the "culture area" concept. 3 s.h. (w) La Barre

126. Peoples of the World: Oceania. Selected problems in the development of pre-European and post-European cultures. The relationships

between man and Pacific environments. 3 s.h. (w) Bowers

128. Peoples of the World: Asia. A comprehensive survey focusing on the peoples and societies of South, Southeast and East Asia, including the prehistoric, ethnic, linguistic, religious and political foundations of the complex civilizations; the response of traditional Indian, Chinese and Japanese cultures to the West. 3 s.h. (w) McCormack and Rowe

130. Cultural Change and Stability. Contemporary theories of culture change, especially those resulting from acculturation and from implementation of programs of technical and economic aid; a consideration of the factors significant in maintaining stability or stimulating change in

traditional cultures. 3 s.h. (w) Rowe

134. Political Anthropology. Comparative study of conflict and political action. Decision making as related to social structure and cultural values. Stateless, emergent, and underdeveloped societies. 3 s.h. (w) Rowe

137. Comparative Social Organization. Social anthropological analysis of role structures and corporate groups in particular societies, and their relevance for understanding the historic process of civilization. Case study of social types and of the unique features of societies revealed by the comparative method. 3 s.h. (w) McCormack

193. Independent Study. Directed reading and research. Open only to highly qualified students in the senior year, by permission of the Director

of Undergraduate Studies. 3 s.h. (w) Staff

199. The Changing South. (See Interdisciplinary Course 199.)

220. Society and Culture in India. The basic features of Indian cultures and societies from an anthropological perspective. The impact of selected technological and social changes upon the individual, caste, and community. 3 s.h. (w) Rowe and McCormack

222. Topics in African Anthropology. Current research problems in African anthropology, illustrated by a study of tribal societies, in terms of contemporary theories about culture and society. 3 s.h. (w) Beidel-

man

231. Physical Anthropology. Human evolution, primate phylogeny, paleontology of man and other primates, primate biochemical genetics, primate behavior, human variation (genetic and somatic). (Also listed as

Anatomy M 231.) 3 s.h. (w) Buettner-Janusch

232. Human Genetics. Particular emphasis upon the uniqueness of studies in genetics, biochemical genetics, population genetics. Prerequisites: Anatomy 231, Zoology 131 (or an elementary course in biology including genetics) or permission of instructor. (Also listed as Anatomy 232 and Zoology 232) 3 s.h. (w) Buettner-Janusch

238. Language and Society. An introduction to the study of language and society. Universal features of language, language as a mirror of society and social perception through language, language as a coding system, linguistics and anthropology, applied linguistics. 3 s.h. (w)

Apte and McCormack

249. Economic Anthropology. Economic organization and behavior in preliterate, peasant and transitional societies; analysis of ownership and distribution. The relationship of economic processes to norms and

institutions such as markets. 3 s.h. (w) Rowe

260. Linguistic Anthropology: Phonemics. Application of descriptive linguistics to analysis of language; concentration on the sound system of a South Asian language, and other non-Western languages. 3 s.h. (w)

Apte

261. Linguistic Anthropology: Morphology and Syntax. Application of descriptive linguistics to analysis of language; concentration on the grammatical system of a South Asian language, and other non-Western languages. Prerequisite: Anthropology 260. 3 s.h. (w) Apte

262. Anthropology of Law. Legal decision in preliterate societies. The interrelationships of law, ritual, and myth. 3 s.h. (w) Beidelman

263. Primitive Art and Music. A comparative ethnological study of non-European art and music; sufficient technical background will be provided for non-specialist students. 3 s.h. (w) La Barre

264. Primitive Religion. The ethnography, the social functions, and the socio-psychological meanings of religion in primitive societies. 3 s.h. (w)

LaBarre

265. Personality and Society. The sociology and social psychology of human personality, its origins in the primary group, its nature and varieties and its integrations into secondary group institutions. 3 s.h. (w) La Barre

266. Personality and Culture. The influence of culture patterns and social institutions upon character structure, socialization of the individual, and the dynamics of human personality. Comprehensive anthropological

materials will be drawn upon. 3 s.h. (w) La Barre

276. Analysis of Kinship Systems. Primitive relationship categories as related to legal norms, ritual and social groupings. Theoretical issues and contrasting approaches to the analysis of social classification terminologies. 3 s.h. (w) McCormack

291, 292. Anthropological Theory. Theoretical, methodological and comparative issues in anthropology. 6 s.h. (w) Beidelman and Rowe

Departmental Major in Anthropology

Major Requirements. Twenty-four semester hours of work in Anthropology including both Anthropology 93 and 94 and at least six semester hours in the Senior-Graduate courses.

Related Work. A minimum of eighteen semester hours, at least twelve of which are normally chosen from two of the following fields: anatomy, art, botany, economics, history, mathematics, political science, psychology, and zoology. Additional courses in other fields may be elected as related work when indicated by the educational requirements of the student and approved by the Departmental adviser.

Spanish

For courses in Spanish, see Romance Languages, p. 164.

University Courses

Fall Semester

199.2 The Arts at Mid-Century. Iain Hamilton

Zoology

Professor Horn, Chairman; Professor Bailey, Director of Undergraduate Studies; Associate Professor Wainwright, Supervisor of Freshman Instruction; Professors Bookhout, Fluke, Gray, Gregg, Livingstone, Menzies, Schmidt-Nielsen, and Wilbur; Adjunct Professor Stefánsson; Associate Professors Buettner-Janusch, Costlow, Hunter, Klopfer, Nicklas, Tucker, Vernberg, and Ward; Assistant Professors Doyle, Herreid and Vogel; Instructors Calder, Davis and Saleuddin

1-2. Biology. (See course listing under Biology 1-2.)

53. Comparative Vertebrate Anatomy. A study of the anatomy and evolution of the organ systems of vertebrates. Prerequisites: Biology 1-2. 4 s.h. (w) Horn

71. Heredity and Eugenics. Effects of environment and heredity upon the individual and populations; interpretation of human genetic histories.

Prerequisite: one year of biology. 3 s.h. (w) Ward

92. General Embryology. An introduction to the study of developmental processes. Prerequisite: Biology 1-2. Recommended: Zoology 53.

4 s.h. (w) Gregg

- 103. Principles of Ecology. An introduction to the study of organisms in natural habitats, with particular attention to the growth of animal populations, the chemical role of organisms, energy flow through food chains, and the development of ecological systems through geologic time. Prerequisites: Biology 1-2, Mathematics 17 or 21. 4 s.h. (w) Living-stone
- 109. Evolution. Analysis of the processes of adaptation and evolution in individuals, populations, and genetic systems. Lectures and student reports. Prerequisite: Genetics or consent of the instructor. 3 s.h. (w)
- 110. Introduction to Genetics. The principles and practical application of genetics. Prerequisite: one year of biology or consent of instructor.

3 s.h. With laboratory-4 s.h. (w) Ward

120. Ornithology. Lectures, laboratory and field trips dealing with the classification, adaptations, and natural history of birds. Prerequisite: one

year of biology. Zoology 53 recommended. 4 s.h. (w) Bailey

131. Human Evolution. Evolution of the order Primates and the origins of man. Primate paleontology, biochemical genetics, primate behavior, human variation. Prerequisites: A year of biology and a course in genetics. (Combined course with Anthropology 131). 3 s.h. (w) Buettner-Janusch

148. Elementary Biochemistry. The chemistry of proteins, lipids, carbohydrates and nucleic acids and the metabolic interrelationships of these compounds. Subjects of special interest to biologists, including photosynthesis, chemical genetics, vision, nutrition and the chemical basis of muscle and nerve function. Prerequisites: Chemistry 151, one year of college physics (second semester may be concurrent), Mathematics 22, or consent of the instructor. 3 s.h. (w) Davidson and Fridovich (Biochemistry)

151. Principles of Physiology. An introductory survey of physiological functions. Prerequisites: At least a year of zoology and a year of chem-

istry. 4 s.h. (w) Tucker

161. Animal Parasites. An introductory course dealing with biological principles involved in parasitism of animals including man. Prerequisite: one year of zoology. 4 s.h. (w) Mrs. Hunter

196. Seminar. Open to junior and senior departmental majors. 2 s.h.

(w) Tucker

197, 198. Special Problems. Senior and Junior majors who have had proper training may be permitted to carry on special work. Permission must be obtained from the Director of Undergraduate Studies and the instructor under whom the student wishes to work. Not more than 4 s.h. may be counted toward major work. (w)

For Seniors and Graduates

201. Animal Behavior. A review of the major developments in the field with emphasis on recent physiological and developmental studies. Prerequisites: physiology, genetics and evolution, or consent of instructor. 3 s.h.; 4 s.h. with laboratory. (w) Klopfer

203. Ecology. Relation of animals to environment. Lectures, readings,

reports, conferences; laboratory and field work. 4 s.h. (w) Gray

210. Experimental Genetics. The relationship of phenotype to genome and environment; cytogenetics, recent research in the field of genetics.

Prerequisites: Consent of instructor. 4 s.h. (w)

214. Biological Oceanography. Composition in time and space of marine biosphere in relation to descriptive marine chemistry, physics, and geology. Some work at sea aboard the research vessel. Prerequisites: A course in invertebrate zoology, ecology, marine biology or an appropriate equivalent; chemistry through organic; one year of physics and mathematics. 4 s.h. (Given at Beaufort only.) Menzies

215. General Physical and Chemical Oceanography. Relief of the ocean floor; physical and chemical properties of sea water; distribution of temperature, salinity and density; heat budget; sea ice; light; ocean currents, waves and tides; selected topics of regional oceanography. Prerequisites: One year each of physics and chemistry, Mathematics 22 or equivalent. 6 s.h. (Given at Beaufort only.) Stefánsson

216. Limnology. A study of lakes, ponds and streams, including their origin, development, geochemistry, energy balance, productivity, and the dynamics of plant and animal communities living in them. Lectures, field trips, and laboratory work. Usually offered in alternate years. Prerequisites: one year each of biology, chemistry and physics, and Mathematics 21; or permission of instructor. 4 s.h. (w) Livingstone

218. Oceanographic Techniques. Theoretical and practical experience at sea aboard R/V EASTWARD in the use of equipment, facilities and data for oceanographic research. Limited to 12 students. 2 units.

(Given at Beaufort) Menzies

222. Entomology. Anatomy, physiology, embryology, and classification

of insects. Prerequisite: One year of zoology. 4 s.h. (w) Gray

224. Vertebrate Zoology. A study of life histories, adaptations, ecology, and classification of vertebrate animals. Prerequisite: Zoology 53. 4 s.h. (w) Bailey

228. Experimental Embryology. Lectures, readings, reports, and lab-

oratory work. 4 s.h. (w) Gregg

232. Human Genetics. Particular emphasis upon unique applications to human beings of genetics, biochemical genetics, population genetics. Prerequisites: Anatomy 231 (Zoology 131) or permission of the instructor. 3 units. (w) Buettner-Janusch

238. Systematic Zoology. The fundamental theory and practice involved in the collection, identification, and classification of animals. Pre-

requisites: Biology 1-2. 4 s.h. (w) Bailey

243. Cytology. The structure of the cell. Prerequisite: one year of biology. (Combined course with Botany 203.) 4 s.h. (w) Anderson

(Botany) and Nicklas

244. Topics in Cell Structure and Function. Advanced discussions of selected problems such as chromosome structure, mitosis, and cytological aspects of inheritance and development. Prerequisite: Zoology 243 (Botany 203) or equivalent and permission of the instructor. 2 s.h. (w) Nicklas and Moses (Anatomy)

245. Radiation Biology. Actions of ionizing and excitational radiations on life processes: a survey and an adventure in biophysics. Prerequisites: College physics, mathematics and organic chemistry. 3 s.h., or 4 s.h. with

laboratory (w) Fluke

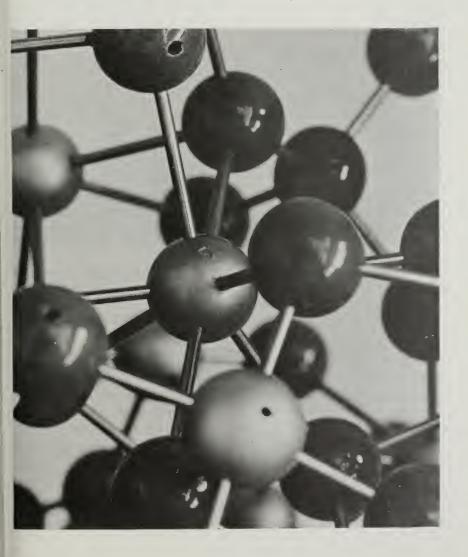
246. Physical Biology. Physical principles of structure and function in large biological molecules and aggregates, applications to function at higher levels of organization, and to biological fitness. Prerequisites: Mathematics 22, Chemistry 151, Physics 41, and one and one-half years of college biology or consent of the instructors. 4 units. (w) Fluke and Wainwright

247. Biological Nucleonics. Fundamentals of nucleonics instruction in biological uses of radioactive tracers, in counting instruments and mea-

surements, and in legal requirements. Prerequisites: Consent of instructor and one year each of college biology, chemistry and physics. 3 s.h.

(w) Fluke and Woods (Forestry)

250. Physiological Ecology of Marine Animals. A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla and from various habitats are studied. Prerequisite: Zoology 151 or equivalent. 6 s.h. (Given at Beaufort only.) Vernberg
252. Comparative Physiology. The physiological mechanisms of ani-



mals studied on a comparative basis. Prerequisite: Zoology 151 or equiv-

alent. 4 s.h. (w) K. Schmidt-Nielsen

271. Cellular Physiology. The physiological processes of living matter approached through studies of cells. Prerequisites: Two years of biology and at least one year of chemistry. 4 s.h. (w) Wilbur

274. Invertebrate Zoology. Structure, functions, and habits of invertebrate animals under normal and experimental conditions. Field trips will be made to study, collect, and classify animals in their natural habitats. Prerequisites: Biology 1-2. 6 s.h. (Given at Beaufort only)

278. Invertebrate Embryology. Lectures, readings and laboratory work dealing with rearing, development, and life history of invertebrates. Pre-

requisite: Zoology 92. 4 s.h. (w) Bookhout

Marine Laboratory. The following courses are given at Duke University Marine Laboratory, Beaufort, N. C.: 203, Marine Ecology; 214, Biological Oceanography; 215, General Physical and Chemical Oceanography; 250, Physiological Ecology of Marine Animals; 274, Marine Invertebrate Zoology. Consult the announcement of the Duke University Marine Laboratory.

Departmental Major

Prerequisites. Biology 1-2.

Major Requirements (for both A.B. and B.S. degrees). A minimum of 24 s.h. of zoology including at least one course in each of the following three areas: morphology (53, 92, 274, or 278), physiology (151, 252 or 271), and genetics (71 or 110).

With the prior approval of the Director of Undergraduate Studies, up to 6 s.h. of advanced work in the natural and formal sciences, other than zoology, may be counted toward the 24 s.h. of the zoology major.

Related Work.

For the A.B. Degree:

Related work will include at least one year of chemistry with additional work usually chosen from courses in botany, chemistry, geology, mathematics, or physics. The language requirement will preferably be met by French, German, or Russian.

For the B.S. Degree:

Related work will include Chemistry 151 and 152 with additional work chosen from courses in botany, geology, mathematics or physics. Language requirements may be met by two languages, chosen from German, French, or Russian.

For interdisciplinary programs involving biology see page 11 of this

Bulletin.



The Department offers work leading to graduation with distinction. See the section on Honors.

School of Engineering

Engineering Non-Departmental Undergraduate Courses

Engrg 1. Engineering Design I. Introduction to the "engineering process" through solving problems of engineering design. Problems are posed so that the student will gain some experience in utilizing his knowledge to devise logical solutions. Elements of engineering graphics are included as a means of visualizing and communicating engineering problem solutions. 2 s.h. (w) Bock, Hill, Holland, and Lewis

Engrg 2. Engineering Design II. Continuation of engineering design, the problems being larger in scope than those of the first semester, involving larger design teams, the supposition of more realistic budgets, and

closer attention to ultimate feasibility. Principles of orthographic projection applied to graphics problems involving intersections and development of surfaces and the relationship of lines and planes; charts, graphs, graphical calculus. Introduction to use of digital computer in engineering design. 2 s.h. (w) Bock, Hill, and Lewis

Engrg 23. Statics. Analysis of force systems and their equilibrium as applied to engineering systems; algebraic methods used with vector notation where appropriate. Principle of virtual work, stability of equilibrium; friction; distributed force systems; equilibrium of differential elements. Corequisite: Math 22. 3 s.h. (w) Arges, Nash, and Palmer

Engrg 53. Engineering Design III. An introduction to the theory and techniques of measurement with emphasis on the design of measurement systems: the nature of experimental error, interpretation of experimental data, and error analysis. Laboratory with design and execution of selected

measurement problems. Prerequisite: Math 22. 2 s.h. (w)

Engrg 63. Introductory Electric Systems I. Complete analysis (transient and steady state) by transform methods of linear lumped parameter networks. Primary emphasis on electric networks but mechanical and electro-mechanical networks included. Application of modern analysis techniques to present day electrical engineering systems that are of concern to all engineers, e.g., amplifiers and transducers. Laboratory included. Corequisites: Math 63 and Phys 41. 4 s.h. (w) George, Hacker, Joines, and Trickey

Engrg 73. Mechanics of Deformable Bodies. Stresses and strains in deformable bodies; mechanical behavior of materials and relation of stress to strain; applications of principles to static problems of beams, torsion members, columns, elementary shells; introduction to energy principles, applications. Selected laboratory work. Prerequisite: Engrg 23. 3 s.h.

(w) Arges and Harrawood

Engrg 83. The Structure and Properties of Solids. An introduction to materials science and engineering, emphasizing the relationships between the structure of a solid and its properties. The atomic and molecular origins of electrical, mechanical and chemical properties are treated in detail for metals, alloys, polymers, ceramics, glasses and composite materials. Prerequisite: Chem 2. Corequisite: Engrg 73, and Math 63. 3 s.h. (w) Buzzard and Pearsall

Engrg 101. Thermodynamics. A basic study of the laws of thermodynamics and their use in engineering analysis and design. The study of the thermodynamic properties of substances is included. Prerequisite: Chem 2, Phys 42. 3 s.h. (w)

Engrg 113. Introductory Electric Systems II. A continuation of Engrg 63. Selected laboratory work. 3 s.h. (w) (First offered in 1967-68)

Engrg 115. Dynamics. General principles of dynamics as applied to particles and rigid bodies. Translation, rotation, general plane motion,

work and energy, impulse and momentum, gyroscopic motion. Prerequisite: Engrg 57; concurrent: Math 64. 3 s.h. (w) (Not offered after 1966–67) Barton

Engrg 123. *Dynamics*. General principles of dynamics of engineering systems. Kinematics of motion; dynamics of particles, systems of particles, rigid bodies. Impulse-momentum and work-energy principles. Introduction to advanced methods in dynamics; Lagrange's equation. Prerequisite: Engrg 23, Phys 41. Corequisite: Math 64. 3 s.h. (w)

Engrg 128. Fluid Mechanics. Physical properties of fluids, fluid statics, continuity and energy principles, pressure-momentum principle, elementary principles of trubines and pumps, flow of a real fluid, dimensional analysis and dynamic similarity, fluid flow in closed conduits and in open channels; fluid measurements. Prerequisite: Engrg 60, or concurrent: Engrg 115. Prerequisite: Math 64. 3 s.h. (w) (Not offered after 1966–67) Harrawood and Kumar

Engrg 133. Heat Transfer. An introduction to the concepts of conduction, convection and radiation. A study of temperature gradients, steady and transient heat flow by analytical, graphical, numerical and analogical methods. Selected laboratory work. Corequisite: Engrg 101, Math 64. 2 s.h. (w)

Engrg 143. Fluid Mechanics. Physical properties of fluids; fluid flow concepts and basic equations; continuity, energy and momentum principles; dimensional analysis and dynamic similitude; viscous effects; applications, emphasizing one-dimensional flow theory for incompressible, real fluids. Selected laboratory work. Corequisite: Engrg 123, Math 64. 2 s.h. (w)

Engrg 163. Fields. Treatment of selected topics in field theory of interest to engineers. Basic field concepts, the Laplacian, field sources, waves, diffusion, continuum concepts, the wave nature of elementary particles. The common structure of field theory is applied to selected topics such as thermal conduction, fluid fields, stress-strain in elastic solids, electric and magnetic fields, and electromagnetic fields. Selected laboratory work. Corequisite: Math 111; Engrg 113, 123, 133, and 143. 3 s.h. (w) (First offered in 1967–68)

Engrg 169.° Legal Aspects of Engineering. A course designed to introduce engineering students to those aspects of the law encountered in the practice of engineering. Subjects included are: contracts and specifications, real and personal property, torts, insurance, agency, equity, evidence, labor management, sales, expert testimony, engineering registration and ethics. Open to seniors only. 3 s.h. (w) Olive

Engrg 170.* Patent Law for Engineers. A course designed to familiarize engineering students with the legal principles and procedures for

^{*}Offered only upon sufficient demand; enrollment limited.

protecting patentable inventions, such as drafting and analysis of specifications and claims, study of infringements, assignments, licenses, and record documentation. Open to seniors only. 3 s.h. (w) Olive

Civil Engineering

Associate Professor Hill, Acting Chairman; Professor Brown, Chairman; Professor Bryan, Director of Undergraduate Studies; Professor Vesic; Associate Professors Barton, and Palmer; Assistant Professors Arges, Harrawood, and Holland; Visiting Professors Abeles, and Owen; Visiting Associate Professor Kumar; Visiting Instructor Strickland

CE 96. Geodetic and Location Measurements. The theory of measurements and errors associated with controlling and locating systems of constructed facilities; modern field methods and equipment. Laboratory

included. Prerequisite: Engrg 53. 3 s.h. (w)

CE 101. Soil Mechanics Laboratory. Soil exploration and sampling. Laboratory determination of index properties: water content, void ratio, particle size, Atterberg limits. Consolidation testing. Triaxial shear testing. Classification and identification of soils. Compaction testing. Demonstrations of seepage, bearing capacity and earth pressure phenomena. phenomena. Concurrent: CE 135. 1 s.h. (w) (Not offered after 1967-68.) Vesić

CE 110.* Plane Surveying. Use and adjustment of instruments; transittape, and stadia surveying; differential and profile leveling; calculation of bearings, latitudes, departures, and areas; accuracy and errors; topographic mapping. Prerequisites: Engrg 1 and Math 21. 3 s.h. (w) Arges

CE 113. Route Surveying. Simple, compound and reverse curves; spirals; earthwork and grading plans. Prerequisite: CE 61. 2 s.h. (w)

(Not offered after 1966-67.) Strickland

CE 116. Transportation Engineering. History of transportation problems; highway, air, pipeline, mass and rapid means of transporting people and materials; design problems requiring the collection and processing of data; selection of transportation means, development of routes, and evaluation of solutions. Concurrent: CE 96. 3 s.h. (w) Holland

CE 118. Materials of Construction. Determination of physical and mechanical properties of construction materials and their components; use of properties as a basis for design; effect of loading, time, and environment on properties; design of construction materials. Laboratory included. Prerequisites: Engrg 73 and 83. 2 s.h. (w)

CE 121.* Hydrology. Fundamentals of meteorology; precipitation; evaporation. Ground water development. Stream flow and stream gaging.

Offered only upon sufficient demand; enrollment limited.

Hydrograph analysis. Flood routing. Field trips to be arranged. Preuisite: Engrg 128 or 143. 3 s.h. (w) Bryan

computations. Irrigation and drainage problems. Flood control and

CE 123. Fundamentals of Hydraulic Engineering. Steady pipe flow systems, including compound pipes and pipe loops and system components including pumps, turbines, and valves. Unsteady pipe flow and surge control systems. Analog computer applications to hydraulic transient analysis and design. Flow in open channels. Water surface profiles in prismatic and natural channels. Selected laboratory work. Prerequisite: Engrg 128 or 143. 3 s.h. (w) Bryan

CE 124. Fundamentals of Sanitary Engineering. Elements of descriptive hydrology with particular relevance to water supply and drainage; quantitative physical, chemical, and bacteriological characterization of water and waste-waters; introduction to water treatment processes, and wastewater treatment and disposal systems; elements of environmental sanitation including land, water, and air considerations. Laboratory included. Prerequisite: Chem 2 and CE 123 or permission of instructor. 3

s.h. (w) Bryan

CE 126.° Sanitary Engineering Design. Design of facilities for providing an adequate supply of water and means for treatment and disposal of wastes. Stream sanitation as it affects location and design of treatment

works. Prerequisites: CE 123 and 124. 3 s.h. (w) Bryan

CE 131. Structural Mechanics I. A unified treatment of the methods of analysis of statically determinant and indeterminant structural systems. Serves as an introduction to the process of applying the engineering method to the creation of structures. Prerequisites: Engrg 73 and Math 64. 3 s.h. (w)

CE 132. Structural Design. Tension, compression, flexural members, eccentric connections, unsymmetrical bending, riveted and welded plate girders, trusses and office building frames. Timber design using ring connectors. Design and detail drawings. Prerequisite: CE 131. 4 s.h. (w)

(Not offered after 1967-68.) Palmer

CE 133. Structural Design I. Non-homogeneous materials. Theory and design of compression and flexural members. Emphasis on ultimate strength theory for concrete. Timber connections. Selected design problems in concrete to include forms and timber supports. Prerequisite:

Engrg 73. Concurrent CE 131. 3 s.h. (w)

CE 134. Structural Design II. Design in metals, primarily steel. Tension, compression, and flexural members. Riveted, bolted, and welded connections, including eccentric connections. Built-up members. Design by elastic and plastic methods. Selected problems to include computations and drawings. Prerequisite: CE 131. 3 s.h. (w)

CE 135. Introduction to Soil Mechanics. Origin and composition of soils, soil structure. Flow of water through soils, capillary and osmotic

Offered only upon sufficient demand; enrollment limited.

phenomena. Soil behavior under stress; compressibility, shear strength. Elements of mechanics of soil masses with application to problems of bearing capacity of foundations, earth pressure on retaining walls, and stability of slopes. Prerequisites: Engrg 107, 109, and 128; concurrent:

CE 101. 2 s.h. (w) (Not offered after 1967-68.) Vesic

CE 139. Introduction to Soil Mechanics. Origin and composition of soils; soil structure. Flow of water through soils; capillary and osmotic phenomena. Soil behavior under stress; compressibility, shear strength. Elements of mechanics of soil masses with application to problems of bearing capacity of foundations, earth pressure on retaining walls, and stability of slopes. Laboratory included. Prerequisites: Engrg 73, Engrg 83, and CE 123. (w) 3 s.h.

CE 140.* Structural Mechanics II. Analysis of statically indeterminate structures by various methods including those of elastic energy. Pre-

requisite: CE 131. 3 s.h. (w) Owen

ČE 143, 144. Projects in Civil Engineering. This course may be assigned by the Chairman of the Department to certain seniors who have shown an aptitude for research, in which case it may be substituted for

certain civil engineering courses. 3-6 s.h. (w) Staff

CE 146. Professional Engineering. Topics related to the practice of civil engineering: engineering economy, contracts, specifications, and ethics. Presentation of student papers on historical and current aspects of Civil engineering. Seniors only. 2 s.h. (w) (Not offered after 1967-68.) Palmer

CE 148.° Structural Engineering. Structural design utilizing metals, concrete and timber. Planning, preliminary design, organization of design procedures and specifications. Prerequisites: CE 132 and CE 133. 3 s.h. (w) Palmer

CE 150. Engineering Systems Analysis. Systems approach to engineering design, and operation problems. Emphasis on linearized models and linear programming. Deterministic models, critical path scheduling, optimization techniques and their application to engineering problems. Prerequisite: Senior standing. 2 s.h. (w)

CE 201. Advanced Mechanics of Materials. Analysis of structural elements described by ordinary differential equations, such as beams on an elastic foundation, curved beams, beam-columns, circular plates; introduction to plates and shells; energy prinicples and their use in structural

analysis. 3 units. (w) Hill

CÉ 202.° Experimental Stress Analysis. The experimental analysis of stress and stain in deformable bodies, correlation of theory with data from experiments; photoelasticity; strain gages; dimensional analysis and similitude principles of models. 3 units. (w) Hill

CE 205. Applied Elasticity. Introduction to linear theory of elasticity; solutions of two-dimensional problems; three-dimensional problems of

*Offered only upon sufficient demand; enrollment limited.

torsion and bending; stress concentrations; energy and variational princi-

ples with applications to design. 3 units. (w) Hill

CE 211. Mechanical Behavior of Materials. Macroscopic mechanical properties of materials for static, fatigue, dynamic and creep conditions; impact, shock, and stress wave properties; temperature, creep, viscoelastic and relaxation properties. 3 units. (w) Kumar

CE 221. Incompressible Fluid Flow. Steady and unsteady pipe flow, theories of turbulent flow; water hammer theory and control; surge tanks; air chambers; the analysis and control of fluid systems; effect of resistance;

tapered conductors. 3 units. (w)

CE 231. Structural Engineering. The application of the fundamental theories of structural action to the design and analysis of structural mem-

bers; specifications. 3 units. (w) Brown

CE 232. Reinforced Concrete Design. Design and analysis of reinforced concrete members including the influence of shrinkage and plastic flow; bond and diagonal tension; prestressed concrete members. 3 units. (w) Abeles

CE 235.° Foundation Engineering. An introduction to methods of analysis, design and construction of foundations. Bearing capacity and settlement of shallow and deep foundations. Soil exploration; excavation and bracing; drainage and stabilization; underpinning. Foundation vibrations. 3 units. (w) Vesic

CE 243, 244. Sanitary Engineering Unit Operations and Process Design. Fundamental bases for design of water and waste treatment systems, including transport, mixing, sedimentation and filtration, gas transfer, coagulation, and bio-treatment processes. 6 units. (w) Bryan

CE 250.° Engineering Analysis. General concepts of the solutions of engineering problems with special emphasis on digital and analog computer and numerical methods; deflection and stability; torsion of noncircular beams and multicelled thin-walled structures; vibrations of beams and membranes; structures with both uniform and nonuniform properties and with rigid and nonrigid supports. 3 units. (w) Barton

The Department offers work leading to graduation with distinction. See the section on Honors.

Electrical Engineering

Professor Wilson, Chairman; Professor Owen, Acting Chairman; Professor Meier, Director of Undergraduate Studies; Professors Artley and Vail; Associate Professors Kerr, Kraybill, Pilkington, and Wells; Adjunct Associate Professor Burger; Assistant Professors George, Hacker, Joines, and Nolte; Lecturers Olive, Parker, Trickey, and Wortman; Messrs. Bemis, Buckley, Capowski, Fair, Feng, Griffin, Halford, Plumer, and Wyatt

Offered only upon sufficient demand; enrollment limited.

EE 109-110. Electromagnetic Systems. Mathematical and physical consideration of energy relations and forces associated with both discrete particles and materials in electromagnetic fields: vector notation; Maxwell's equations; static and quasi-static fields; energy, power flow, and impedance; particle ballistics; electron emission; control of conduction in vacuums, gases, liquids, and solids; resistance, capacitance, and inductance of systems of conductors; forces between relatively moving bodies; dielectric and magnetic material. Prerequisite: EE 56. Concurrent: Mathematics 111. Three class sessions and one two-hour computation. 8 s.h. (w) (Not offered after 1966-67) Artley and Vail

EE 111-112. Electrical Principles Laboratory. Instruction in electrical laboratory techniques; experimental study of basic principles of electromagnetics, electronics, and electric and magnetic circuits. Prerequisite: EE 56. Concurrent: EE 109-110. Two three-hour laboratory periods throughout first semester; one throughout second semester. 3 s.h. (w)

(Not offered after 1966-67) Fair, Griffin, and Plumer

EE 161. Electronics and Signals. Techniques for the analysis and design of electronic circuits with emphasis on graphical and piece-wise-linear methods; applications of these methods to particular circuits, including transistor and tube amplifiers, oscillators and switching circuits. Introduction to amplitude-, frequency-, and pulse-modulation systems. Prerequisite: Engrg 113. Two class sessions and one computation or laboratory session. 3 s.h. (w) (First offered in 1967-68)

EE 162. Electromechanical Energy Conversion. Principles of energy storage and conversion utilizing magnetic and electric fields; analytical treatment of dynamic equations of motion, including the Euler-Lagrange approach; applications to the design of electromechanical transducers and rotating machines. Prerequisites: Engrg 113, 123, 163. Two class

sessions. 2 s.h. (w) (First offered in 1968-69)

EE 163. Physical Electronics. Study of physical processes under the influence of electric, magnetic, thermal, and stress fields with contemporary electrical engineering applications: e.g. transistors, thermoelectric energy converters, and magnetic devices. Prerequisites: Engrg 163 and Physics 161. Corequisite: EE 164. Two class sessions and one computa-

tion or laboratory. 3 s.h. (w) (First offered in 1968-69)

EE 164. Electromagnetic Fields and Waves. Electric and magnetic fields; Maxwell's equations developed from Coulomb's, Ampere's and Faraday's laws and the solenoidal nature of the magnetic field; electrostatics; magnetostatics; quasi-static and stationary fields; electromagnetic waves; retarded potential; relaxation time, reflection, polarization, and radiation of electromagnetic waves; transmission lines; probability waves in periodic structures. Prerequisite: Engrg 63. Two class sessions and one computation or laboratory. 3 s.h. (w) (First offered in 1968-69)

EE 165-166. Electrical Engineering Seminar. A course which provides

an opportunity to consider matters related to the professional practice of electrical engineering; to relate the undergraduate program of studies to current practice; and to improve the ability to communicate more effectively, both in verbal and written form, particularly with regard to technical material. One class session. 2 s.h. (w) (Not offered after 1967-68) Staff

EE 167. Design Colloquium. A course planned to guide the student in learning how the fundamental principles studied in the academic program are translated into the realities of engineering practice. The vehicle will be an extensive and intensive study of a significant modern engineering project. Extensive reference to published information and possible site visits to the projects will be part of the mode of operation, as will written and oral reports. 2 s.h. (w) (First offered in 1968-69)

EE 173-174.* Projects in Electrical Engineering. A course which may be undertaken only by seniors who are in the Graduation with Distinction Program, or who may have had previous experience directly related to the proposed project. The consent of the Director of Undergraduate Studies must be obtained before registering. 1-6 s.h. (w)

EE 181-182. Electronic Networks. Advanced topics in engineering electronics: piece-wise linear approximation for nonlinear operation and incremental models for linear operation of basic electronic circuits; narrowand wide-band amplifiers; feedback amplifiers; oscillators; modulation and demodulation; microwave devices; communication systems. Prerequisite: EE 110. Concurrent: EE 183-184. Three class sessions. 6 s.h. (w) (Not offered after 1967-68) Nolte and Owen

EE 183-184. Electronics Laboratory. Laboratory course paralleling and integrated with course EE 181-182, with which is should be taken concurrently. One three-hour laboratory. 2 s.h. (w) (Not offered after

1967-68) Capowski, Griffin, and Nolte

EE 185. Pulse and Digital Electronics. Generation and shaping waveforms encountered in information processing systems, such as radar, computer, control and instrumentation. Typical circuit functions included are linear and nonlinear wave shaping, pulse and time-base generation, time delay, counting and gating. Emphasis on the application of semiconductor devices to the realization of circuit functions. Prerequisite: EE 161. Two class sessions and one computation or laboratory session. 3 s.h. (w) (First offered in 1968-69)

EE 186. Modulation Systems and Noise. Analysis and design of modulation systems. Description of deterministic and probabilistic signals: power spectra; sampling theory; amplitude- and frequency- and pulsemodulation systems; pulse-modulation techniques. Sources and characteristics of noise; comparison of various modulation systems. Prerequisite: EE 161. Selected laboratory work. 3 s.h. (w) (First offered in

1968-69)

^{*} Offered only upon sufficient demand; enrollment limited.

EE 187. Electronic Processes in Materials. Prediction and explanation of the response of ferroelectric, magnetic, superconductor, and semi-conductor materials to thermal, electric, magnetic and stress fields. Exploration of possibilities of improving the materials. Two class sessions and one computation or laboratory. Prerequisite: EE 163. 3 s.h. (w) (First offered in 1968-69)

EE 188. Dynamics of Electromechanical Energy Conversion. An analytical and experimental study of the dynamic characteristics of electromechanical energy conversion devices that are utilized in both control and power applications. Two class sessions and one three-hour labora-

tory. Prerequisite: EE 162. 3 s.h. (w) (First offered in 1968-69)

ÉE 191-192. Electric Machinery. Application of circuit and field principles to underlying theory of static and rotating electric machinery; mathematical techniques for analyzing transformers and electromechanical energy converters as individual devices and when interconnected into systems. Prerequisite: EE 110. Concurrent: EE 193-194. Three class sessions. 6 s.h. (w) (Not offered after 1967-68) Parker and Trickey

EE 193-194. Energy Conversion Laboratory. Selected experiments in energy conversion combining the theory and practice of transformers, electro-mechanical devices including motors and generators, photovoltaic sources, thermo-electric generators, static d-c to a-c and d-c to d-c converters. Prerequisite: EE 112. Concurrent: EE 191-192. 2 s.h. (w) (Not offered after 1967-68) Bemis and Halford

EE 195.* Nuclear Engineering Fundamentals. Review of nuclear physics; fission and the chain reaction; nuclear reactor principles and concepts; materials, instrumentation, and control of nuclear reactors; selected topics in nuclear engineering. Prerequisite: Physics 161. 3 s.h. (w)

Meier and Wortman

EE 196. Microwaves and Quantum Electronics. A study of the special field and circuit techniques required at microwave frequencies; electromagnetic wave propagation in unbounded and bounded media; transmission and reflection properties of various microwave networks. Equivalent circuits and matrix methods will facilitate analysis. Discussion of microwave amplifiers and oscillators, including klystrons, magnetrons, traveling-wave tubes, and masers. Selected laboratory experiments. Prerequisite: EE 164. Two class sessions and one computation or laboratory. 3 s.h. (w) Joines

EE 197. Solid-State Materials. Prediction and explanation of the response of ferroelectric, ferromagnetic, ferrimagnetic, and semiconductor materials to thermal, electric, magnetic and stress fields. Exploration of possibilities of improving the materials. Two class sessions and one three-hour laboratory. Prerequisites: Mathematics 111 and one course from among Physics 161, EE 110, CE 118, and ME 59. 3 s.h. (w) Pilkington

EE 199. Linear Feedback Systems. Analysis and design of linear; con-

tinuous-data feedback control systems; stability tests; time and frequency domain methods; root locus method; performance specifications; study of electrical, mechanical, hydraulic, aerodynamic, pneumatic, and thermal systems. Two class sessions and one three-hour laboratory. Prerequisite: permission of instructor. 3 s.h. (w) Wells

EE 203. Random Signals and Noise. Introduction to mathematical methods of describing and analyzing random signals and noise. Review of basic probability theory; joint, conditional, and marginal distributions; random processes. Time and ensemble averages, correlation, and power spectra. Optimum linear smoothing and predicting filters. Introduction to optimum signal detection and parameter estimation, with applications such as radar. Selected laboratory work. 3 units. (w) Kerr and Owen

EE 204. Information Theory and Communication Systems. Information and entropy and their application in communication situations. Noise and channel capacity, coding, and the fundamental theorem of information theory. Continuous channels and transmission of bandlimited signals. Comparisons of various practical modulation techniques from the standpoint of information rate and error probability. Prerequisite: 203. 3 units. (w) Nolte

EE 205. Signal Detection and Extraction Theory. Fundamentals of signal detection theory and its application to radar, sonar, and communication systems. Design of optimum detectors for known signals, for signals with unknown parameters, and for signals transmitted through fading channels. Analysis and comparison of optimum noise immunity of practical amplitude, pulse, and frequency modulation systems. Prerequisite: EE 203 or permission of instructor. 3 units. (w) Nolte

EE 206. Switching and Logic Networks. Techniques for the analysis and design of switching and logic networks. Number systems and Boolean algebra; codes; minimizing techniques; logic elements logic networks. Prerequisite: permission of instructor. 3 units. (w) George

EE 211. Solid State Theory. The fundamental theory of wave motion in solids. Wave mechanics; variational method; perturbation theory; many-electron problems; one-electron approximation; free-electron approximation; electron spin; Brillouin zones; time-depndent Schrodinger's equation; and transition probabilities. Introduction to thermostatics and statistical mechanics. Prerequisite: permission of instructor. 3 units. (w) Hacker and Pilkington

EE 212. Solid State Materials. Concepts of solid state physics as applied to engineering materials; electric, magnetic, thermal, and mechanical properties of solids; dielectrics; semiconductors; magnetic materials; and superconductors. Selected laboratory work. Prerequisite: EE 211. 3 units. (w) Hacker

EE 213. Principles of Magnetism. Classical field theory and quantum

Offered only upon sufficient demand; enrollment limited.

mechanical descriptions of magnetic properties of materials. Diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism, and ferrimagnetism. Resonance of relaxation in magnetic materials. Anisotropy, magnetostriction, domain theory and switching properties. Selected topics to relate theory of magnetism to applications of engineering interest. Prerequisite: EÉ 211 or permission of instructor. 3 units. (w) Hacker

EE 215. Semiconductor Physics. A quantitative treatment of the physical processes that underlie semiconductor device operation. Topics include: Band theory and conduction phenomena; equilibrium and non-equilibrium charge carrier densities; charge generation, injection, and recombination; drift and diffusion processes; low and high field conduction. Prerequisite: EE 211 or permission of instructor. 3 units. (w) Hacker

EE 217. Masers. Principles of masers, particularly optical masers. Discussion of quantum electronics, optical configuration; solid state, gaseous, and liquid devices; modulation; high power operation. Prerequisite: permission of instructor. Two class sessions and laboratory. 3 units. (w)

George

EE 222. Nonlinear Analysis. Introduction to methods of analyzing engineering systems described by nonlinear differential equations: analytic, numerical, graphical, and series approximation methods; analysis of singular points; stability of nonlinear systems. Applications of various methods, such as the modified Euler, Runge-Kutta, isoclines, perturbation, reversion, variation of parameters, residuals, harmonic balance, Bendixon, and Liapounov to phenomena of nonlinear resonance, subharmonics, relaxation oscillations, and forced oscillating systems. Prerequisite: permission of instructor. 3 units. (w) Wilson

EE 225. Semiconductor Electronic Circuits. Analysis and design of electronic circuits utilizing a variety of static and dynamic models of semiconductor devices. Transistor and other semiconductor device circuit models; bias stability; high frequency and noise models switching characteristics; illustrative semiconductor circuits. Prerequisite: permission of instructor. Selected laboratory work. 3 units. (w) Joines and

Owen

EE 227. Network Synthesis. Linear network theory, including a review of time and frequency domain analysis; network graphs; network functions and realizability condition; driving point impedance synthesis of passive networks; driving point and transfer specifications; approximation methods. Prerequisite: permission of instructor. 3 units. (w) George and Vail

EE 241. Linear Control Systems. Theoretical and applied principles of design of linear, continuous-data control systems. Integration of system elements into a closed loop system. Stability from Routh, Nyquist and root locus viewpoints. Time and frequency domain methods. Perfor-

mance improvement using compensation. Disturbances and multiple inputs. Two class sessions and one three-hour laboratory. Prerequisite: permission of instructor. Credit not given for both EE 199 and EE 241.

3 units. (w) Wells

EE 244. Selected Topics in Control Systems. Analysis and design of linear sampled-data systems using Z-transform and modified Nyquist approaches. Analysis of linear systems with statistical inputs and nonlinear systems using describing functions. Analog and digital computer techniques for the solution of appropriate problems. Prerequisite: EE 203 and either EE 199 or EE 241. 3 units. (w) Wells

EE 259. Advanced Electric Energy Conversion. Equations of motion of electromechanical systems; fields and lumped parameters, state function concepts; mathematical techniques for analyzing electromechanical devices and systems; transducers; unified treatment employing matrix, tensor, and block-diagram concepts to obtain response under static and dynamic conditions: the generalized rotating machine. Prerequisite: permission of instructor. 3 units. (w) Trickey

EE 271. Electromagnetic Theory. The classical theory of Maxwells equations; electrostatics, magnetostatics, boundary value problems including numerical solutions, currents and their interactions, force and energy relations. Three class sessions. Prerequisite: permission of

instructor. 3 units. (w) Joines

EE 272. Applications of Electromagnetic Theory. Propagation of electromagnetic waves in various structures and media; mathematical description of microwave networks, including equivalent circuits and matrix methods; microwave circuit theorems and synthesis techniques. Selected laboratory experiments. Prerequisite: EE 271. 3 units. (w) Joines

The Department offers work leading to graduation with distinction. See the section on Honors.

Mechanical Engineering

Professor Chaddock, Chairman; Professor Kenyon, Director of Undergraduate Studies; Professors Linderoth, Macduff, Meriam, and Pearsall; Associate Professors Boyle, Elsevier, and Harman; Assistant Professors Buzzard, Lewis, and Nash; Visiting Lecturer Bock; Messrs. Cheng, Gaillard, V. Kumar, Lau and Lim

ME 59. Materials and Processes. Elementary metallurgy and introduction to modern theories of the solid state; selection and properties of engineering materials and effect of forming processes upon properties. Prerequisite: senior standing. 3 s.h. (w) Pearsall

ME 101-102. Engineering Thermodynamics. A basic study of the laws of thermodynamics and their use in engineering analysis and design.

Properties of pure subtances; vapor cycles; fluid flow; thermodynamic machinery; introduction to combustion processes. Prerequisite: Chem 1,

Phys 42. Concurrent: Math 64. 6 s.h. (w) Elsevier

ME 103. Thermodynamics. A terminal course in thermodynamics and its engineering applications for civil and electrical engineering students. The basic laws of thermodynamics; gases; vapors; elements of combustion and heat transfer. Prerequisite: Chem 1, Phys 42. Concurrent: Math 64. 3 s.h. (w) Buzzard, Harman, and Kenyon

ME 106. Heat Transfer. A basic course covering the elements of radiation, conduction, and convection. Methods of temperature measurement, steady and transient heat flow, analytical and numerical methods. Concurrent: ME 101, 105; Math 64. 3 s.h. (w) Chaddock and Kenyon

ME 114. Junior Mechanical Engineering Laboratory. Measurement of mechanical and thermodynamic properties of systems. Student planning and reporting of laboratory experiments in temperature, pressure, velocity, acceleration, flow, energy and power measurements. Prerequisite: ME 101, 105. 2 s.h. (w) Harman and Staff

ME 116. Mechanical Engineering Laboratory. Primarily for civil and electrical engineering students. Selected laboratory experiments in measuring mechanical and thermodynamics properties of systems. Student planning of experiments in temperature, pressure, velocity, acceleration, flow, energy and power measurements. Concurrent: ME 103. 1 s.h. (w) Staff

ME 128. Dynamics of Gases. The flow of compressible fluids at high velocities. One-dimensional compressible flow; area change; normal shock; friction and heat transfer; Mach number. Prerequisite: ME 102.

Concurrent: ME 106. 3 s.h. (w) Buzzard and Harman

ME 141. Machine Design. Elements of mechanism with special attention to the role of invention in mechanical design. Velocity and acceleration in mechanisms from both scalar and vector viewpoints. Prerequisite: Math 63. Concurrent: ME 52, E 57 or 60. 3 s.h. (w) Linderoth and Nash

ME 142. Machine Design. Continuation of ME 141. Static and dynamic forces in machinery. The instant center; theory of gear tooth profiles. Design of machine elements, such as gears, springs, and bearings; complex parts. Prerequisite: ME 141. Concurrent E 107. 3 s.h. (w) Linderoth and Nash

ME 153.° Heating, Air Conditioning, and Refrigeration. Principles of thermodynamics, heat transfer, and fluid flow applied to comfort and industrial air conditioning. Cycles and equipment for heating, cooling, and humidity control. Air transmission and distribution. Modern vapor compression, absorption and low temperature refrigeration cycles and systems. Prerequisite: ME 102 and 106. 3 s.h. (w) Elsevier

ME 156. Combustion Engines. A study of cycles, fuels, and fuel mix-

*Offered only upon sufficient demand; enrollment limited.

tures in piston, ram jet, and rocket engines. Comparison of real and theoretical cycles; carburetion and fuel injection systems; modern devel-

opments. Prerequisite: ME 102. 3 s.h. (w) Elsevier

ME 159-160. Senior Mechanical Engineering Laboratory. Laboratory determination of heat flow and operating characteristics of engines, fans, pumps, and other power and refrigeration plant components; vibrational systems, control systems, analog methods. Student planning and reporting of original experiments. 2 s.h. (w) Elsevier and Staff

ME 162. Power Plants. Basic concepts of thermodynamics, heat transfer and fluid flow are combined with industrial data for the consideration of real power plant problems. Selection of steam generators, prime movers, fans, pumps, heaters, and piping systems with regard to engineering and economic points of view. Prerequisite: ME 102. 3 s.h. (w) Harman

ME 163.° Vibration Control. An introduction to the dynamics of mechanical systems; equilibrium, stability, lumped and distributed systems, cradle and field balancing. System analysis by classical differential equations, mechanical impedance, operational calculus and analog simulation. Prerequisite: Math 64 and ME 141. 3 s.h. (w) Macduff

ME 166. Air Conditioning Design. Typical air conditioning systems considered in relation to specific problems. Equipment analysis and performance, economic considerations, system control and response, noise generation and attenuation. Prerequisite: ME 153. 3 s.h. (w) Elsevier

ME 167.° Industrial Engineering. A study of the organization and functioning of industries; function of engineering in industry; job analysis and self evaluation; professional and executive responsibility of the mechanical engineer. Prerequisite: senior standing. 3 s.h. (w) Lewis

ME 168.° Industrial Engineering Production Methods. Study of engineering theory, methods and controls in production. Methods, motion and time study, plant lay-out, production and quality control, industrial safety, operations research. Prerequisite: senior standing, ME 167 or equivalent. 3 s.h. (w) Lewis

ME 171. Response of Physical Systems. An introduction to the basic fundamentals of instrumentation and of the control of processes and systems with emphasis on correlation of analysis and exprimental results.

Prerequisite: Math 111. 3 s.h. (w) Buzzard and Macduff

ME 173-174. Mechanical Engineering Seminar. A course designed to keep the students abreast of progress in the engineering field and to develop their ability to express ideas effectively in speech and writing.

Open to seniors only. 2 s.h. (w) Kenyon and Linderoth

ME 182.* Fundamentals of Nuclear Engineering. Review of nuclear physics, nuclear interactions and cross sections, neutron induced chain reactions, shielding, hazards, isotope utilizations, reactor systems and power reactors. Prerequisite: permission of instructor. 3 s.h. (w) Kenyon

Offered only upon sufficient demand; enrollment limited.

ME 197-198. Projects in Mechanical Engineering. This course may be assigned by the Chairman of the Department to outstanding seniors who express a desire for such work and who have shown aptitude for research in one distinct field of mechanical engineering. Prerequisite: 3.0 average and senior standing. 1-6 s.h. (w) Staff

ME 201.° Theoretical and Applied Mechanics. Introduction to the theory of elasticity and vibration analysis. 3 units. (w) Macduff and

Meriam

ME 202.° Theoretical Thermodynamics. Classical thermodynamics and thermodynamic continuum properties for real substances; equilibrium; introduction to statistical thermodynamics. 3 units. (w) Harman

ME 221.° Compressible Fluid Flow. The concepts and analysis for flow of gases in subsonic to hypersonic regimes. Two-dimensional flow; oblique shocks; experimental techniques. 3 units. (w) Harman and Buzzard

ME 222.° Heat Transfer. Steady state and transient solutions of the general heat conduction equation. Development of the equations for transport of energy by fluid motion. Principle of similarity and dimensional analysis in convective energy transport. The boundary layer equations; the laws of radiation transfer; radiation heat exchange. 3 units. (w) Chaddock and Kenyon

ME 231.° Systems Engineering. Methods applicable to design for obtaining parameters for strength, response and stability studies of mechanical systems. Analysis of closed loop control systems with linear transfer functions; electrical and mechanical analogs; introduction to determination of transfer function from input-output characteristics. 3 units. (w)

Macduff

ME 232.° Systems Engineering. Effect on design of inherent system nonlinearities; eigenvalues and eigenvectors of simple systems with nonlinear springs; nonlinear damping; methods of linearization. Frequency response of nonlinear systems by approximate methods; transient and frequency response of nonlinear systems by numerical integration and transfer matrices. 3 units. (w) Macduff

ME 280. Nuclear Reactor Power Cycles. Basic reactor principles and types. Examination of most feasible thermodynamic cycles for use with both stationary and mobile power plants. Consideration of safety shielding, heat transfer, fluid flow and materials problems unique to reactor

design. 3 units. (w) Kenyon

The Department offers work leading to graduation with distinction. See the section on Honors.

Offered only upon sufficient demand; enrollment limited.

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BULLETIN OF DUKE UNIVERSITY

The School of Nursing 1967



Annual Bulletins

For Bulletin of Information for Prospective Students, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The School of Engineering, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to The Dean of the Divinity School, Duke University, Durham, N. C.

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The School of Nursing 1967

Durham, North Carolina 1967



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Calendar of the School of Nursing

The Summer Session 1967

June

- Monday—Registration for Summer Session courses 12
- Tuesday-Instruction begins in all courses scheduled for first term 13 of Summer Session

July

- Monday, Tuesday—No Summer Session classes meet 3, 4
- Monday, Tuesday-Examinations 17, 18
 - Thursday-Registration for new students, second term of Sum-20 mer Session
 - Friday-Instruction begins in all second term Summer Session 21 courses

August

- 12 Saturday—No Summer Session classes meet
- 25 Friday—Final examinations

Academic Year 1967-1968

September

- Wednesday-Senior Clinical courses as scheduled
- Friday, 7:30 p.m.-Orientation begins for all entering Freshmen and new students with advanced standing
- Monday-Registration and matriculation of students who have not 18 pre-registered
- Wednesday-Final registration of pre-registered students
- Thursday-Fall semester classes begin 21

November

4 Saturday-Last day for reporting six-weeks grades

- 22 Wednesday, 12:30 p.m.—Thanksgiving recess begins
- 27 Monday, 8:10 a.m.-Classes are resumed*

December

- 11 Monday-Founder's Day
- 20 Wednesday, 12:30 p.m.-Christmas recess begins

1968

January

- 3 Wednesday, 8:10 a.m.-Classes are resumed°
- 13 Saturday, 12:30 p.m.—Fall semester classes end
- 17 Wednesday-Final examinations begin
- 26 Friday-Final examinations end
- 30 Tuesday-Registration and matriculation of new students
- 31 Wednesday-Last day for matriculation for Spring semester

February

Thursday—Spring semester classes begin

March

- 13 Wednesday-Last day for reporting six-weeks grades
- 23 Saturday, 12:30 p.m.-Spring recess begins

April

1 Monday, 8:10 a.m.—Classes are resumed*

May

- 16 Thursday, 5:00 p.m.—Spring semester classes end
- 20 Monday-Final examinations begin
- 29 Wednesday-Final examinations end

June

- 1 Saturday-Commencement begins
- 2 Sunday—Commencement Sermon
- 3 Monday-Graduation Exercises

^{*}Nursing Laboratory sessions in Clinical Nursing courses are resumed according to the normal schedule.

Officers of the School for the Year 1967-68

General Administration

Douglas Maitland Knight, Ph.D., Litt.D., LL.D., L.H.D., President

Robert Taylor Cole, Ph.D., Provost

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Institutional Studies, Assistant Provost

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Craufurd David Goodwin, Ph.D., Assistant Provost

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Benjamin Edward Powell, Ph.D., Librarian

Richard Lovejoy Tuthill, Ed.D., University Registrar

Rufus H. Powell, LL.B., Secretary of the University

Edwin Constant Bryson, LL.B., University Counsel

School of Nursing Administration

Ann Madeline Jacobansky, R.N., M.Ed., Dean, School of Nursing-1200 Leon Street

Virginia Stone, R.N., Ph.D., Director of Graduate Studies-2511 Pickett Road

Eleanor Gaillard, A.B., Librarian-2505 Weaver Street

Raymond Ingraham, Administrative Assistant-RD #1 Box 281B

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Executive Committee of School of Nursing

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Committee on Undergraduate Studies

A. M. Jacobansky, *Chairman*, J. Crane, G. Fortune, V. Gover, T. Horton, W. Minniear, J. Hester, V. Stone, R. Phillips, R. Proctor

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Promotions: Ann M. Jacobansky, Acting Chairman

Committee on Graduate Studies

V. Stone, Chairman, J. Crane, K. Kintzell, W. Minniear, J. Straub

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Geraldine Bodie, R.N., M.S.N., Supervisor, Medical Nursing Service
Lelia Clark, R.N., M.A., Director of Nursing Service
Gertrude Elliott, R.N., Supervisor, Obstetric-Gynecology
Bonnie Hensley, R.N., B.S.N., Supervisor, Pediatric Nursing Service
Sara Jeffreys, R.N., Supervisor, Surgical Nursing Service
Lynne Miller, R.N., B.S.N., Supervisor, Psychiatric Nursing Service
Mary E. McColm, R.N., M.S.P.H., Assistant Director of Nursing Service,
Outpatient Clinics

Margaret Mitchell, R.N., M.S., Assistant Director, Nursing Service Patricia Weber, R.N., M.S.N., Assistant Director of Nursing Service, Psychiatric Nursing

North Carolina Cerebral Palsy Hospital

Christine Vick, Administrator Ava T. Albritten, R.N., Director Nursing Service Lennox Baker, M.D., Medical Director

Durham Veterans Administration

Nelson A. Jackson, B.S., M.H.A., Administrator
Grace E. Farley, R.N., B.S., Chief, Nursing Service
Margaret I. Williams, R.N., M.S., Assistant Chief, Nursing Service
Margaret S. Rosser, R.N., M.S., Associate Chief, Nursing Service for Education

School of Nursing Faculty

April, 1967

- Grace Bullock, R.N., M.S.N., Instructor in Nursing-Hermine Street
- Mary Jane Mordan Burch, R.N., M.S.N., M.Ed., Associate Professor of Nursing—Route #2, Chapel Hill, N.C.
- *Janet Campbell, R.N., M.A., Assistant Professor of Nursing—East Lake Anne Drive, Raleigh, N. C.
- Janet Craig, R.N., M.S.N., Instructor in Nursing-405 Leon Street
- Joyce Crane, R.N., M.S.N., Assistant Professor of Nursing-2717 Augusta Drive
- Charles Culver, Ph.D., Assistant Professor of Psychology—2920 Guess Road Ollie Davenport, R.N., M.S.N., Assistant Professor of Nursing—905 W. Knox Street
- Frances Dunham, Ph.D., Assistant Professor of Psychology-2137 Wright Avenue, Greensboro
- Diane Fogleman, R.N., M.S.N., Instructor in Nursing-4424 S. Alston Avenue
- Ellen Gwendolyn Fortune, R.N., M.S.N., Associate Professor of Nursing— 212 E. Markham Avenue
- Virginia Gover, R.N., M.S., Assistant Professor of Nursing-2722 Brown Avenue
- Carlene Grim, R.N., M.S.N., Instructor in Nursing—2121 W. Pettigrew St. Julia Hester, R.N., M.S., Assistant Professor of Nursing—Colonial Apartments, Chapel Hill Street
- Carole Hogue, R.N., M.S.N., Assistant Professor of Nursing-2913 Welcome Drive
- Theresa E. Horton, R.N., M.N.Ed., Assistant Professor of Nursing-810 Clarendon Street
- Ann M. Jacobansky, R.N., M.Ed., Professor of Nursing-Apt. H-8, 1200 Leon St.

^{*} On leave of absence 1967-68.

Kay G. Kintzel, R.N., M.S., Instructor in Nursing-University Garden Apartments, Chapel Hill, N. C.

Patricia Kennedy, R.N., M.S.N., Instructor in Nursing-Apt. 5, 900 W.

Trinity St.

Patricia Lawrence, R.N., M.A., Assistant Professor of Nursing-4711 Easley Street

Wilma A. Minniear, R.N., M.S.N., Associate Professor of Nursing—212 E. Markham Avenue

Nancy Nolan, R.N., M.S.N., Assistant Professor of Nursing—707 Louise Circle

Sue Norville, R.N., M.S.N., Assistant Professor of Nursing-705 Louise Circle

Edythe Persing, R.N., M.N., Assistant Professor of Nursing—RD#2, Chapel Hill, N. C.

Frances Phillips, R.N., M.S.N., *Instructor in Nursing*—5 Powell St., Chapel Hill, N. C.

Roberta Phillips, R.N., M.S.N., Assistant Professor of Nursing—Colonial Apartments, Chapel Hill, N. C.

Ruth Proctor, R.N., M.S.N., Assistant Professor of Nursing—2417 Dellwood Dr.

Charlene Schwab, R.N., M.S., Instructor in Nursing—1000 Ruby Street Virginia Stone, R.N., Ph.D., Professor of Nursing—2511 Pickett Road

Jeannette Straub, R.N., M.S.N., Instructor in Nursing—2020 Pershing St. *Ruby Wilson, R.N., M.S.N., Assistant Professor of Nursing—3006 University Dr.

Helen Young, R.N., M.S., Assistant Professor of Nursing-5400 Newhall Road



Instructional Assistants

Ann Bohnet, R.N., B.S.N. Beverly Flint, R.N., B.S.N. Willetta Murphy, R.N., B.S.N. Margaret Rastall, R.N., B.S.N. Helen Tilley, R.N., B.S.N.

Part-Time Instructional Staff

Lelia Clark, R.N., M.A., Professor of Nursing Service Cecil Slome, Ph.D., Lecturer Margaret Mitchell, R.N., M.Ed., Assistant Director of Nursing Service Mary Helen McLachlan, M.A., Associate Professor of Dietetics Alice Joanne Graham, B.S., Instructor in Dietetics Jane Mulaik, R.N., M.S.N., Instructor in Nursing

Student Life

Mary Jane Burch, R.N., M.S.N., M.Ed., Assistant Dean in Charge of Student Life
Dorothy Wilkinson, R.N., House Counselor
Viola Clark, House Counselor
Barbara Boone, B.S., House Counselor

Student Health

Marguerite Benway, M.D., Student Health Physician Helen Howard, R.N., Health Office Nurse





General Information

Philosophy of the School of Nursing

The School of Nursing functions within the philosophy of Duke University. This philosophy is epitomized by its motto, Eruditio et Religio, which "reflects a fundamental faith in the union of knowledge and religion, the advancement of learning, the defense of scholarship, the love of freedom and truth, a spirit of tolerance, and a rendering of the greatest service to the individual, the state, the nation and the church. Through changing generations of students, the objective has been to encourage each individual to achieve to the extent of his capacities an understanding and appreciation of the world in which he lives, his relationship to it, his opportunities, and his responsibilities."

The faculty of the School of Nursing ascribes to the concept that a professional nurse is a person who has acquired the specialized knowledge of Nursing, who has attained abilities useful in practice of Nursing, and who has developed attitudes appropriate to the profession of Nursing.

The faculty conceives professional nursing to be a service which contributes to the health and well being of people. Professional nursing practice is dealing with human beings under stress, frequently over long periods of time; providing comfort and support in times of pain, anxiety, loneliness, and helplessness; perceiving, evaluating, and intervening appropriately; administering medications and treatments; using clinical nursing judgment in establishing, maintaining, and/or modifying a plan of

care; and knowing when and how to use existing and potential resources to help patients toward recovery and adjustment. Professional nursing practice is sharing responsibility for the health and welfare of all those in the community; participating in programs designed to prevent illness and maintain health; coordinating professional and technical services in the best interest of patient care; and supervising, teaching, and directing all those who give nursing care. Professional nursing practice requires constant evaluation; asks questions and seeks answers which will add to the body of nursing theories; and transmits and uses the theories, as well as other research findings, to improve services to patients and service programs to people. Professional nursing practice requires knowledge and skill of high order and provides opportunities for personal and professional fulfillment.

The faculty believes that the primary aim of nursing education is to provide an environment in which the student can develop self-discipline, intellectual curiosity, the ability to think critically, and acquire the knowledge necessary for practice. The faculty believes that learning is manifested by change of behavior, resulting from experience; that an atmosphere for learning is one in which systematic direction and guidance of the learner is offered in a climate which encourages self-direction and creativity; that professional nurse education implies that the student who seeks admission to the school comes with the intent of practicing professional nursing; and, that the curriculum offered aids the student in realizing this intent and in stimulating the desire for continued professional growth.

The School of Nursing is committed to promoting human health and welfare through providing foundations for knowledgeable nursing services and is committed to contributing to the attainment of the Univer-

sity's aims of teaching, research, and public service.

The school aims to prepare its graduates to function as practitioners of professional nursing in roles most appropriate to the level of their preparation. The school aims to provide its students with an educational background which will serve as a basis for advanced study in nursing, and for continued personal and professional growth.

History

The School of Nursing of Duke University was established in association with the School of Medicine and Duke Hospital. The first class of students was admitted in January, 1931. In 1953, the School of Nursing was incorporated into the Division of Health Affairs in the University structure. When established, the three-year curriculum leading to the Diploma in Nursing was planned to prepare young women to meet com-

munity nursing needs; students who completed two years of acceptable college work were awarded a Bachelor of Science degree in Nursing in addition to the Diploma in Nursing. Trends in nursing created a demand for a four-year program leading to the degree of Bachelor of Science in Nursing, and in 1953, the University Board of Trustees approved such a program. The Master of Science in Nursing Degree was authorized in 1956.

Graduates of Duke University School of Nursing have served their communities in North Carolina and in other states; they have participated in their professional organizations on a national, state, and local level. During World War II, graduates of this school staffed the 65th General

Hospital of the Duke University Medical Unit.

Relationship to the University

As a part of the University community, the School of Nursing serves its students as the focus of a total educational experience that only a major university can provide. It shares the same campus with Trinity College, College of Engineering, the Graduate School of Arts and Sciences, the Divinity School, and the Schools of Law, Medicine, and Forestry, and Duke Medical Center. The facilities for library, laboratory, and field work, and the many activities-religious, intellectual, cultural, and athletic -form part of the environment which contributes to the development of students in nursing. Thus, the student in nursing may enjoy simultaneously the broad facilities and challenges of a University and the life and atmosphere of a professional school.

Membership and Accreditation

Duke University, which incorporates the School of Nursing with all of the other schools of the University, is a member of the Association of American Colleges and is accredited by the Southern Association of Colleges and Secondary Schools.

The generic program leading to the degree of Bachelor of Science in Nursing is accredited by the National League for Nursing and the North

Carolina Board of Nursing.

The School is a member of the Department of Baccalaureate and Higher Degree Programs of the National League for Nursing.

Undergraduate Course of Study and Requirements for Degree

The Bachelor of Science in Nursing

The School of Nursing offers a program which is planned to cover a period of four years; four academic years and three summer terms. At the completion of this program, the student receives the degree of Bachelor of Science in Nursing and is then eligible for the examinations

given by the North Carolina State Board of Nurse Examiners.

The program of undergraduate study in nursing offers an opportunity for selected high school graduates to earn the professional degree Bachelor of Science in Nursing. The objectives of the curriculum are: (1) to provide opportunities for gaining the basic knowledge, skills, and attitudes of the developing professional nurse; (2) to provide the foundations for continuing learning and study; and (3) to provide students with information which can equip them to function as workers and as citizens in a changing society. The curriculum aims toward the development of minds capable of meeting health needs of society through roles appropriate for a beginning practitioner of professional nursing.

Undergraduate study in nursing aims to develop a continual desire for knowledge through experiences planned for the development of desirable attitudes. These attitudes include a concern for personal enrichment and appreciation of, and the respect for, individuality and an awareness of the nurse's role as a citizen in contributing to her own development and to

that of her community and profession.

Undergraduate study in nursing aims to develop a continual desire for knowledge through experiences planned for the development of desirable attitudes. These attitudes include a concern for personal enrichment and appreciation of, and the respect for, individuality, and an awareness of the nurse's role as a citizen in contributing to her own development and to that of her community and profession.

Like all education, undergraduate education in nursing can only initiate the process of growth that will ultimately result in intellectual maturity and social responsibility. Developing professional persons need to leave school with an awareness that they must continue to grow intellectually; that they must have foundations which distinguish them as individuals with open minds and a curiosity about life; and that they should be equipped to supplement their knowledge, skills, and attitudes as required in a changing world.

The purposes and objectives of the undergraduate program of study are compatible with the statement of characteristics of baccalaureate educa-

tion in nursing developed by the National League for Nursing.

Requirements for Degree

To fulfill the requirements for the degree of Bachelor of Science in Nursing, a student must complete the program with a C average, must complete 132 semester hours as outlined below, earn 264 quality points, and show proficiency in the practice of nursing.

The requirements for the degree of Bachelor of Science in Nursing are based on the principle that the student will derive the maximum benefit if the program includes a broad distribution of studies among representa-

tive fields.

For graduation with the degree of Bachelor of Science in Nursing, the following course work or equivalent must be completed.

These requirements are described in detail below.

s.h.
6
8
24
12-15
2
13-16
64
132

English. 6 s.h. This requirement is met by the completion of English

Basic Science. 8 s.h. To satisfy this requirement, the student must complete a one year laboratory course in one of the basic sciences: Biology,

Chemistry, or Physics.

Social Sciences. 24 s.h. The following courses will satisfy this requirement: Psychology 91, Psychology 116, Sociology 91, and Sociology 150. Three of the remaining twelve hours must be selected from Sociology, three from Psychology and six hours from Political Science, Economics or History (students who do not present for entrance two acceptable units of History must select History).

Electives (Art, Music, Philosophy, Literature or Religion). 12-15 s.h. This requirement can be satisfied by a total of twelve semester hours and no more than 6 hours in one area: English or American literature, Greek literature, foreign literature courses, literature courses in translation, courses in aesthetics, art, music, and courses in Religion and Philosophy (except 48, 103, 104, 109). The student who is not required to complete N50, is required to complete three additional hours of electives for a total of fifteen semester hours.

Physical Education. 2 s.h. Physical Education is required during the

first year and should be completed by the end of the first year.

Nursing Related Sciences. 13-16 s.h. To satisfy this requirement, the student must complete the courses N4, N50-51, N52, N53. If a student has completed Chemistry 1-2, N50 will not be required.

Nursing Major. 64 s.h. This requirement is met by completing nursing

courses in accordance with the regulations described elsewhere.

To complete the requirements in the regular period (four years), the work is planned as follows:

First Year

	s.I	ı.
English 1-2		6
Social Science		6
(History, Political Science or Economics)		
Elective		6
(Art, Music, Philosophy, Literature or Religion)		
Nursing 1-2		4
Basic Science		8
(Biology, Physics, or Chemistry)		
Nursing 4 (Introduction to Microbiology)		3
Physical Education 1-2		2
Total		

Summer Session

Nursing or E	50 (Introd lective (I	duction to Basic Chemistry)		
		Total		
		Second Year		
Nursing Sociology Elective	52 (Introc 53 Norma 91-92 Fun 7 91 Gene (Sociolog	duction to Bio-Chemistry) 3 luction of Human Anatomy and Physiology) 4 ll and Therapeutic Nutrition 3 luction of Nursing 12 leval Sociology 3 ly and Psychology) 6 ly Art, Music, Philosophy or Literature) 6 location Total 37		
		Third Year		
		s.h.		
Nursing Nursing Nursing Nursing Nursing Sociology Psycholo Nursing	130 141 142 155 / 150 gy 116	Pediatric Nursing6Obstetric Nursing6Medical-Surgical Nursing Theory5Medical-Surgical Nursing Practicum4Social Forces and Community Health3The Family3Psychology of Adjustment3Public Health Sciences3Total33		
Fourth Year				
		s.h.		
Nursing Nursing Nursing Nursing	170 181	Social Foundation of Nursing3Psychiatric Nursing6Public Health Nursing6Nursing Team Leadership and Intensive Nursing Care6		
		Total		

Resources for Study

Instructional Facilities

The facilities for instruction include the facilities available in the undergraduate, professional, and graduate schools and colleges of Duke University and the clinical facilities of Duke Hospital, the North Carolina Cerebral Palsy Hospital, the Veteran's Administration Hospital, and the Durham Health Department.

In a wing of Hanes House are located the administrative offices of the School of Nursing, a large classroom seating 100 persons and equipped with audio-visual aids; a small classroom seating 50 persons and equipped with a screen and movie projector, a nursing laboratory with equipment for nursing practice for students, and conference rooms.

Duke Hospital

Duke Hospital, an integral part of the Medical Center, is a 728-bed, 30-bassinet general hospital which performs the concurrent functions of patient care and professional education. It admits over 20,000 patients a year, and maintains comprehensive diagnostic and treatment facilities for their care.

Different levels of patient care are provided by a minimal care unit and intensive care facilities in addition to conventional nursing units.

Private, semi-private, and ward accommodations are available. Approximate daily patient census by service is as follows: Surgery (including Urology, Otolaryngology, Ophthalmology, and Orthopaedics), 332 Medicine (including Dermatology and Neurology), 231 Pediatrics, 78 Psychiatry, 52 and Obstetrics-Gynecology, 45. Surgical facilities include eighteen operating rooms and a recovery room; over 15,000 surgical procedures are performed annually. Two obstetrical delivery rooms are maintained.

Outpatient services include a public clinic which totals some 122,000 visits a year, a private diagnostic clinic of comparable size, and an active emergency service. All of the hospital components are located within a single building. Close working relationships between Duke Hospital and

outside health agencies contribute to continued care.

Duke Hospital is approved for internship and residency training by the Council on Medical Education and Hospitals of the American Medical Association, and conducts an active educational program involving some 280 house staff members. The hospital is fully accredited by the Joint Commission on Accreditation of Hospitals.

Libraries

Nursing Library

A reference library of 6,500 books and periodicals is located in Hanes House for the use of students majoring in nursing. There are available 100 current periodicals on nursing and its allied fields, as well as: The Cumulative Index to Nursing Literature, Index Medicus, International Nursing Index, Nursing Studies Index and Hospital Literature.

The library is open 98 hours a week with reference assistance available. Students may freely use other libraries on campus, both general and

professional.



University Library

The University library, among the first nineteen university libraries in the country, contains 1,800,000 volumes and 3,875,000 manuscripts. About 60,000 volumes are added annually. Separate departmental and professional school libraries provide notable collections in the several disciplines.

More detailed information may be obtained in a Student's Guide to the General Library, available on request to the Librarian of the University.

Medical School Library

The Medical Center Library, located in the Davison Building, attempts to provide all services and collections necessary to further educational, research and clinical activities in the medical field. Extensive reference and bibliographical service is provided. The collection exceeds 80,000 volumes and about 1300 current periodicals are being received, over one hundred of them in duplicate subscriptions.

The Trent Collection in the history of medicine is an unusually fine one, rich in manuscripts and rare books, and provides the opportunity for study

and research as well as easual reading in the field.



Student Life: The Undergraduate Student

Living Accommodations

Housing

Hanes House and Hanes House Annex are residence houses for School of Nursing students. House Counselors, who are members of the Dean's staff, live in the respective houses. The counselors, with the cooperation of the Student Government Executive Council, are responsible for the administration of the houses.

Undergraduate students are required to live in the residence houses unless they are married or are living with parents or relatives. Any exception must be approved by the Dean. Rooms are rented for the academic year, but for a period of not less than one semester. No refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule.

Occupants are expected to abide by the regulations governing the occupancy of rooms as they appear in the student handbook.

Food Services

The dining facilities available to students in the School of Nursing include the Medical Center and West Campus Cafeterias for upperclass students; the Hospital and Graduate Center Cafeterias and the East Campus Union for freshmen and sophomore students. Sophomore and freshman students may not board at places other than those specified. The charge for board is payable, not later than the date of the beginning of each semester, also at the beginning of summer session. Students will not be entitled to a refund on board after the dates of the Fall or Spring midsemester. (See Calendar.) Junior and senior students will not be required to pay Board fees. These students may purchase meals at any of the dining facilities located on West Campus.

Services Available

Medical Care

Students enrolled in the regular program of studies are eligible for the

services offered under the health program of the school.

Complete medical facilities are available to students at the Duke Medical Center under the health program. With the necessary exceptions noted below, this type of care is furnished at a minimum expense to regularly enrolled students. The cost is included in the general fee each semester and in the fees charged for the Summer Session terms.

Physical Examination. Upon admission each student receives a complete physical examination including a chest x-ray. Thereafter, the physical examination is repeated annually; the chest x-ray semi-annually.

Health Office. The health office in Hanes House, under the direction of a physician is maintained for the students in the school. Advice, treatment and examination are available to students during regularly scheduled hours. Consultations with Duke Medical Center staff specialists are arranged through the health office as necessary; arrangements for drugs, dressings, laboratory tests, and x-rays are made as needed.

Hospitalization. A student requiring hospitalization is admitted to Duke Hospital. Admission is arranged through the health office. Medical and surgical care is under the supervision of a senior physician or surgeon. Hospital care includes staff nursing, drugs, dressings, laboratory test and x-rays as needed. Hospital care is limited to thirty days. Non-board paying students are charged board while in hospital or infirmary (Juniors, Seniors).

If the student is covered by an insurance plan which provides for hospitalization, medical or surgical benefits, the coverage should be applied to the cost of care.

Exceptions. The health program does not cover chronic or pre-existing conditions, private duty nursing, refraction of eyes, treatment of teeth, hernias, pilonidal cysts, chronic skin conditions, endoerine disturbances, elective surgery, braees or any orthopaedic appliance, aecidents or illness oecurring during vacation or while off the campus. Blood used for transfusions must be paid for or replaced.

Phychiatric Consultation. Advisory consultation with a psychiatrist ean be arranged at no expense to the student. Further psychotherapeutic

interviews are not included in the health program.

Student Health Insurance. A special commercial policy available only to regularly enrolled Duke students can be secured to furnish complementary protection, if desired. The insurance excludes any coverage for accident or illness cared for under the health program; insurance protection is furnished for off the campus and during vacations.

University Counseling Center

The University maintains a Counseling Center which provides a centralized program of educational, vocational, and personal counseling for students. In addition, the Center administers special group testing programs for University schools and departments and serves as the local testing eenter for a wide variety of national testing programs. The Center also carries on programs of research in the field of measurement and counseling.

Student Activities

Religious Life

"Eruditio et Religio," the motto emblazoned on the seal of the University, proclaims belief in the essential union of knowledge and religion in the educational process. The Gothic Chapel stands at the center of the campus, an inspiring symbol of the place of religion in the well-balanced life. The Chapel program encourages the cultivation of the moral and spiritual life of students.

Opportunities are provided through the Chapel and its related activities to translate worship into effective Christian living. Denominational, interdenominational, and interfaith loyalties are emphasized. Protestant, Roman Catholic, and Jewish students are organized in their respective

groups, each having a denominational chaplain or adviser.

The University Religious Council, composed of students and faculty, promotes the interdenominational religious life in its many facets. The work of the Council and of the denominational program is under the supervision of the Chaplain to the University, who is also Director of Religious Life. He, with two Associate Directors of Religious Life and six denominational chaplains, coordinates the religious program of the campus. These chaplains also offer personal guidance and spiritual counsel to all students in matters related to their faith.

The Dean of the Chapel is a key figure in student religious life. A regular preacher to the University, he preaches in the Chapel each month. He serves as an officiating minister and participates in the planning of the

University's religious program.

Additional opportunities for the enrichment of the student's religious life are offered in organ and carillon recitals, choral concerts, other special services held from time to time, and in the sermons of distinguished guest preachers from many lands who are heard in the Duke Chapel. Some students, at their own discretion, participate actively in the program of the downtown churches of their choice.

Professional, Social, and Cultural Organizations

The scope of student organized activities falls into many broad interest areas, such as student government, service, professional, and honorary,

publications and radio, music, drama, and social activities.

The Union Building, located on the West Campus, is the student center for coeducational activities. It houses, among other groups, the Student Union organization. This body is unique in its coeducational aspects, bringing the men and women together in the carrying out of its stated purpose "to stimulate, promote, and develop the social, recreational, cultural, educational, and spiritual activities of the students of Duke University." This purpose is carried out through a broad program including lectures, recreational activities, dances, and exhibits, adapted to the leisure time interests and needs of all students, who as undergraduate students are members of the Union.

The musical groups include the Chapel Choir, Women's Chorus, Symphony Orchestra, Concert Band, Glee Clubs, and several smaller groups. The Duke Players present a number of plays and readings each season. The Hoof 'n' Horn Players annually produces a musical comedy which is usually written, cast, directed, and acted by students from Trinity, The Woman's College, The School of Engineering, and School of Nursing.

Although there are no chapter houses, the program of the thirteen national sororities having chapters on campus are carried on within sections of the regular dormitories set aside for this purpose. Undergraduate women in the University are provided the opportunity to participate in the program of the sororities if they so desire.

Other campus groups, social in nature, sponsor dances, chaperoned

cabin parties, concerts, and informal discussion groups. Social functions are frequent enough to afford the relaxation needed from work required

in classroom and laboratory.

Student Government Association. The purpose of this organization is to regulate all matters pertaining to the life of the undergraduate woman of Duke University School of Nursing not under the jurisdiction of the faculty; to increase a sense of individual responsibility; and to cooperate with the faculty in creating and maintaining high ideals for the Duke University School of Nursing. Each student is a member of this Association from the time of entrance into the School of Nursing until graduation. An Executive Council, consisting of ten elected members, coordinates the affairs of this Association, conducts the business of the Association in the interim between meetings of the Association, and with the student body is responsible for legislative action.

The Honor System. The purpose of the Honor System is to secure the cooperation of the undergraduate student body in maintaining honorable conduct in all areas of student, professional, and social life. It applies to every undergraduate woman enrolled in the School of Nursing. The Honor System is a vital directive force in all phases of each student's life and is a major working part of the Student Government Association; it carries its influence into all facets of student activities and makes itself

felt by enhancing the individual's feeling of honor.

Santa Filomena. Santa Filomena is a senior honorary society founded at Duke University School of Nursing. Its purpose is to recognize achievement and promote leadership. New members are publicly tapped at the May meeting of Student Government Association. They are selected from the rising Senior class and must fulfill the following three requirements:

1. Maintain a superior average throughout their first two years.

2. Demonstrate superior nursing ability.

3. Make some contribution to the betterment of the School of Nursing.

Santa Filomena strives to serve the nursing profession. Because all proceedings and ceremonies except tapping are secret, this honorary society can perform many varied service activities.

Santa Filomena's color is white; its flower, a white carnation; its pin, a

small gold Florence Nightingale lamp.

The North Carolina State Student Nurses Association. As members of the Duke University School of Nursing, students are members of the National Student Nurses' Association through membership in the North Carolina State Student Nurses' Association. Such membership facilitates social relationships and an interchange of ideas with students of various programs of nursing education throughout the state and nation. Participation in the program of the district, state, and national association provides students with the opportunity to work with and learn more about their colleagues of the future.

Publications

Three magazines and a comprehensive year book are published by students. Student publications are under the control of the Publications Board, composed of members from the University staff appointed by the President, members of junior and senior classes of the four undergraduate colleges, elected by the students of the respective schools, and editors and managers of student publications as *ex officio* members of the Board without voting power. No student publication can be established at the University without the approval of the Board.

The Publications Committee of Duke University School of Nursing Student Government Association is responsible for the following publica-

tions: The Charge, Beaux and Bows, and Nurses Notes.

Prizes and Awards

Duke University School of Nursing Alumnae Award

The Duke University School of Nursing Alumnae Award is presented to a graduating student by the Alumnae Association for leadership, scholarship and nursing skill.

The Moseley Award

The Moseley Award of \$25.00 is given to the student in the senior class who has shown the most skill in the art of nursing throughout her program in the School of Nursing.

Undergraduate Admission

New students are admitted for the academic year at the opening of school in the fall.

Candidates may qualify for admission as members of the freshman class or as students with advanced standing. Since the enrollment is limited, the Committee on Admissions selects students who, in its judgment, are best qualified to benefit from the educational advantages which the school offers. Selection is based on the academic record of the candidate, on test scores, and on satisfactory evidence of good character and general fitness for college life at Duke. A visit to the campus for a personal interview with members of the faculty is of material benefit to the candidate and to the Committee.

Requirements for Admission

Admission to the Freshman Class

A candidate for admission to the freshman class must present at least fifteen acceptable units of secondary school credit. A minimum of twelve units must be in college preparatory subjects, but it is recommended that fifteen be offered. Subjects classified as college preparatory are English, foreign language, history and social studies, mathematics (Algebra and Geometry), and sciences.

Prospective students are urged to broaden their reading outside of class

during their senior year and to make the acquaintance of books and magazines that do not form part of the subject matter of their courses. At the same time, they should take every opportunity to increase their competence in writing. Those who cannot write simple, clear, grammatical English prose will be progressively at a serious disadvantage in the competition for admission and also in the general work of the Freshman year. Careful attention to correctness in English in correspondence and on application blanks cannot be too seriously stressed for candidates for admission.

Applicants are advised to have their scores on the Scholastic Aptitude Tests and the scores on three achievement tests of the College Entrance Examination Board submitted to the Office of Admissions. Graduate nurse applicants should submit one reference from a faculty member of the School of Nursing from which they were graduated and if applicable, from an employer. Interviews with members of the Duke University School of Nursing faculty are desirable and are encouraged.

Evidence of good health will be requested after the applicant is considered for acceptance. Final acceptance will be contingent on a complete physical examination during the week of Orientation. This examination also includes a chest x-ray, blood and urine studies, and skin

tests.

Prerequisites

All applicants for admission to the School of Nursing must present at least fifteen acceptable units of secondary school credit. A unit of credit is allowed for a course of study pursued throughout an academic year at an accredited secondary school, if the course has been completed satisfactorily.

- 1. Twelve units must be in English, foreign language, history and social studies, mathematics, and natural science; and must include:
 - (a) English-3 units.
 - (b) Algebra—1 unit.
 - (c) Plane geometry-1 unit.
 - (d) Chemistry—1 unit.
- 2. The remaining units should include a language, physics, and history. Other units offered in subjects not included in this list will be considered for acceptance on the basis of full statements transmitted with the applicant's record from the school recommending her.

Early Decision Plan

For the well-qualified student who has definitely decided to enter Duke if accepted, the University offers to reserve a place by "early decision" on

December 1 of the student's senior year in secondary school. The deadline date for completing applications for December decision is November 1. Interested students should write to the Office of Admissions for detailed information.

Regular Admission

Candidates for regular admission must apply no later than January 15, and normally do so during the fall of the senior year. For this group, decisions are mailed by April 15.

Candidates for admission to the School of Nursing should address their inquiries to the Office of Admissions, Duke University, Durham, N. C.,

A candidate for admission who wishes to arrange an interview should do so through the Office of Admissions.

Admission to Advanced Standing

Admission by transfer from other institutions may be arranged for a limited number of students, under certain well-defined regulations. All such candidates must submit official transcripts of all work completed at other colleges, accompanied by a statement of honorable dismissal and scores on the Scholastic Aptitude Test of the College Entrance Examination Board. An overall grade average of at least C must have been earned on work previously completed; courses on which a grade less than C has been earned cannot be accepted for transfer credit. Students may not apply for transfer beyond admission to the junior class. Further detailed regulations for admission by transfer may be obtained from the Office of Admissions.

Applicants for advanced standing in the School of Nursing should present, as far as possible, subjects corresponding to those required by the School. They may not, during their first semester, register for more than the minimum number of hours required of the class which they enter, except by permission of the Dean of the School of Nursing.

Graduate nurses applying for admission to advanced standing are required to submit records of previous performance in Nursing, scores on

the Scholastic Aptitude Tests and three Achievement Tests.

Special Students

Graduate nurses may be admitted for special work in such courses of instruction as their earlier training and experience may qualify them to take. They may not be admitted as candidates for a degree in the regular course of study unless they are able to meet all normal requirements for admission, which apply to all beginning students.



Readmission of Former Students

Former students who have for various reasons withdrawn from college and who wish to continue their collegiate careers should apply to the Duke University Office of Admissions with a detailed account of their activities since withdrawal from college.

Undergraduate Program: Financial Information

Fees and Expenses

Fees paid by students cover only a part of the cost of their instruction and of the operation of the University. Income from endowment and contributions from the alumni, alumnae, and other public spirited men and women meet the balance, which constitutes more than half the cost.

Estimated Expenses

Certain basic expenditures are to be considered in preparing a student's budget, such as tuition, the general fee, room and board. All financial information is subject to change without notice. The necessary expenditures with a reasonable amount allotted for miscellaneous items such as laundry, organizational dues, and sundry purchases are shown as follows:

	First	Second		First	Second
	year	year		year	year
Tuition	\$1,450.00	\$1,450.00	Books*	40.00	40.00
Gen. Fees	187.00	187.00	Activities*	15.00	15.00
Room Rent	345.00	345.00	Uniforms*	36.00	51.00
Board	500.00	500.00	Total	2,593.00	2,608.00
Laundry*	20.00	20.00		,000	

Approximate cost.

	Third year	Fourth year		Third year	Fourth year
Tuition	\$1,450.00	\$1,450.00	Books†	40.00	10.00
Gen. Fees	187.00	187.00	Activities†	15.00	15.00
Room Rent	345.00	345.00	Uniforms†		20.00
Board	•	٠	Total	2,057.00	2,047.00
Laundryt	20.00	20.00			

Summer Session **

One term

Room Rent (Double)**	47.50
Board	85.00
Laundry†	3.00
Books†	10.00
	145.50

[&]quot;No board charges will be made for Junior and Senior students. These students will pay for meals on a "pay by the meal" basis. Meal costs may be estimated at \$70 per month as a minimum.

**Charges for one Summer term. Students normally enroll for three terms.

†Approximate cost.

Tuition and Fees

Tuition and General Fee. The tuition of \$725.00 and the general fee of \$93.50 are due and payable not later than the date of the beginning of a particular semester after the day of registration. No refund of the tuition or the general fee will be made except for involuntary withdrawal to enter the armed services.

Bills may be sent to parents or guardians provided the Treasurer has been requested in writing to do so. Failure to pay bills on or before the due dates will debar the student from class attendance until the account is settled in full.

No records are released and no student is considered by the faculty as a candidate for graduation until she has settled with the Treasurer for all indebtedness.

Registration Fees and Deposits. New students, on notification of acceptance, are required to pay a non-refundable first registration fee of \$20.00 and to make a deposit of \$50.00. The \$50.00 deposit will not be refunded to accepted applicants who fail to matriculate. For those who do matriculate, \$25.00 of the deposit serves as a continuing room deposit for successive semesters, and the remaining \$25.00 as a continuing registration deposit.

Refunds

The initial \$25.00 room deposit is effective for the entire college course of the student whose attendance during regular terms is continuous. The deposit will be refunded to resident students under the following conditions: (a) within thirty (30) days after the student has been graduated, (b) upon student's withdrawal from the University residence halls provided a written notice is received by the Director of Housing by August 1 for cancellation of reservation for the fall semester and not later than January 15 for cancellation of reservation for the spring semester, (c) when the reasons requiring withdrawal are beyond the student's control. No refund is made until the occupant has checked out of her room through the Housing Bureau and has settled all her accounts with the Bursar.



Late Registration Fee

Students who register in either semester at a date later than that prescribed must pay to the Treasurer a fee of \$5.00.

Readmission Fee

Students who have been readmitted to the University after an absence of one or more terms on notification of readmission, are required to make the \$50.00 room rent and registration deposit.

Room reservations are made with the Director of Housing. An applicant who has been officially accepted as a resident student is assigned

a room according to an established plan.

Fees for Special Students. Part time special students who register for no more than two courses with a maximum total credit of eight semester hours are charged a registration fee of \$5.00 for each course and \$50.00 for each semester hour. Registration for 9 or more semester hours or 3 or more courses, requires payment of full fees.

Fees for Auditing. Auditing of one or more courses without charge is allowed students paying full fees, provided that the consent of the instructor is obtained. Students who are enrolled for not less than 3 nor more than eight semester hours may audit other courses by payment of \$25.00 for each course audited. Auditors submit no daily work, take no examinations, and receive no credit for courses audited.

Transcript and Fees. A student who wishes to transfer his credits from Duke University to another institution is entitled to one free transcript of his record. A fee of one dollar, payable in advance, is charged for each additional copy. Requests are directed to the Records Office.

Fees for Course Change. Changes in courses for reasons not arising within the University require a payment of \$1.00 for each change made.

The Summer Session

University fees for Summer Session 1967 will be charged at the rate of \$40.00 per semester hour for those admitted with advanced standing. Board for resident students is charged at the rate of \$85.00 for each term of Summer Session; a double room is \$47.50 per person for a term of Summer Session. The cost of laundry is approximately \$.50 per week. A bill is sent to all pre-registered students to permit payment in advance.

Living Expenses

Housing. Hanes House and Hanes House Annex are residence houses for School of Nursing students. Undergraduate students are required to live in the residence houses unless they are married or are living with parents or relatives. Any exception must be approved by the Dean. Rooms are rented for the academic year, but for a period of not less than one semester. No refund of room rent will be made except for involuntary

withdrawal to enter the armed services. Such refunds will be made in ac-

cordance with the University's established schedule.

The rental charge for a single room is \$415.00 for an academic year or \$207.50 per semester. The rental charge per person for a double room is \$345.00 for an academic year or \$172.50 per semester. The rental charge for a single room for a six week summer session term is \$67.00; the rental charge per person for a double room for a six week summer session term is \$47.50.

Food Services. The charge for board is pavable not later than the date of the beginning of each semester, also at the beginning of summer session. Students will not be entitled to a refund on board after the dates of the Fall or Spring mid-semester. (See Calendar.) Junior and senior students will not be required to pay Board fees. These students may purchase meals at any of the dining facilities located on West campus.

Student Aid

Duke University is interested in students with ability and ambition. It is the aim of the University Financial Aid Committee and others affiliated with the Financial Aid Program to provide, insofar as possible, the financial assistance required by students accepted for entrance who are unable to defray the cost of college from their own resources. The assistance is made available in the form of scholarships, grants-in-aid, loans and part-time employment.

Scholarships

Scholarships intended to recognize outstanding students are awarded annually to candidates who evidence qualities which give high promise of

excellence in Nursing.

Candidates for competitive scholarship prizes should initiate applications during the fall semester of the senior year of study in secondary school. Instructions concerning the specific requirements and deadline dates will accompany the application materials sent to applicants for these awards.

A maximum of eleven scholarships will be awarded annually without

reference to geographical area.

All candidates for scholarships are required to take the Scholastic Aptitude Test and three Achievement Tests; English Composition is required as one of the three Achievement Tests of the College Entrance Examination Board in order to qualify for consideration by the Scholarship Committee. The test must be taken either in December or January prior to the September in which admission is sought.

Objective. These awards are scholarships based on merit. They are

intended to encourage young women who give promise of becoming leaders in the field of nursing. Financial need is not a factor in making the awards. The size of the stipend assigned to each winner, however, will vary to some extent with the financial circumstances of the recipient. An honorary stipend for students needing no assistance will be \$200.00.

Eligibility. A student must be accepted for enrollment to the freshman class of the Duke University School of Nursing in the ensuing academic

year to be eligible for consideration for a scholarship award.

Procedure. All candidates for Duke University School of Nursing Scholarships and grants-in-aid who wish to be considered for awards on the basis of their financial circumstances are required to complete the Parents' Confidential Statement of the college scholarship service. This statement may ordinarily be obtained from the high school guidance counselor or principal. Application for scholarship must be submitted by January 1 to the Office of Admissions, Duke University, Durham, North Carolina.

Method of Selection. A scholarship Committee of Duke University faculty members will select the winners and alternates on the basis of the applications submitted. All applicants for scholarship will be notified of their eligibility for competition by March 15.

The Scholarships will be awarded on the following basis:

1. Secondary school scholastic record (candidates will be restricted to the highest quarter of their classes).

- 2. College aptitude as shown by tests, particularly the Scholastic Aptitude Test and the Achievement Tests of the College Entrance Examination Board.
- 3. Breadth of interests and native ability as indicated by extra-curricular activities.
- 4. Participation in church, civic, and other organizations with particular reference to the demonstration of qualities of leadership.

Duration of Award. The award will be made for one year renewable for a second year on the condition that the holder maintain a scholastic average in the top quarter of her class or a "B" average, and further that she show evidence of developing the qualities of leadership which served as the basis for the original selection.

Psychiatric Nursing Undergraduate Training Grant Awards

A limited number of Psychiatric Nursing Undergraduate Training Grant Awards are available to qualified Junior and Senior students. An award provides for an annual stipend plus tuition fees. Additional information about the Psychiatric Nursing Undergraduate Training Grant Awards may be secured in the Dean's office.

To qualify for an award, the student must have an above average

academic record and the potential for admission to graduate study, and must declare intent to pursue a career in the field of Mental Health.

Army and Navy Nurse Corps Student Program

Students in the Basic Nursing Programs may apply for appointments in the Army Student Nurse Program at the beginning of their Junior year, or the Navy Nurse Corps Candidate Program at the beginning of their Senior vear. The appointments carry generous financial allowance. A student who participates twelve months or less serves on active duty in the respective service for twenty-four months. If two years support has been given, she serves thirty-six months.

Grants-in-Aid

Althought sufficient funds are not available to assist all applicants who present requests for aid, a number of grants-in-aid are made each year to able students who need financial assistance in order to meet the cost of attending college. Any candidate for admission, therefore, who considers herself to be in such need is eligible to apply for a grant-in-aid.

Applicants for grants-in-aid will be required to submit a detailed state-

ment of financial resources.

Florence K. Wilson Scholarship Fund. This fund is available to nursing

students who apply for grants-in-aid.

It was established in 1961 by combining the Nurses' Alumnae Association Scholarship Fund, the students' Florence K. Wilson Scholarship Fund and contributions from the Wilson family and friends. The income of this fund is to be used for scholarships for students enrolled in the School of Nursing.

Remissions of Tuition

Certain students attending Duke University are entitled to a remission of the University tuition charge. Students in this group are entitled to a maximum of eight semesters of free tuition at the undergraduate level. Each Summer Session in which work is taken and each semester spent in another institution will be counted as one of the eight allowable semesters. Only those students enrolled in the regular Nursing School program leading to a Bachelor of Science degree in Nursing are entitled to a remission of tuition charge.

Children of ministers who are members of the North Carolina or Western North Carolina Conferences of the Methodist Church are entitled to a remission of the University Tuition charge, as are the children of ministers of all faiths residing in Durham County, North Carolina. This consideration is given only to children of resident members of the two North Carolina conferences who are giving their full time to religious work.

Tuition Grants

Tuition grants are given to the children, step-children, and adopted children of certain qualified staff members of Duke University.

Loans

Since the attainment of college education, like the purchase of a home, is an expensive undertaking students may find it necessary to borrow a portion of the funds required. Duke University has student loan funds available which supplement the program of scholarships and grants-in-aid. All candidates for loans must make a minimum grade of "C" in the semester preceding their application for a loan. Freshmen, therefore, will ordinarily be recommended by the University Scholarship Committee for a student loan which will not exceed the amount of tuition for the second semester.

Loans are granted from the Joseph F. Stein Student Loan Fund by the University Loan Committee upon the recommendation of the Dean of the School of Nursing. This fund was established to provide a means of assistance to students to meet pressing financial problems. The amounts to be loaned are limited in size and will not be charged interest rates if paid prior to termination of the program or if the student completes her program. Should a student, with an outstanding loan, withdraw from the school before she has completed her program, interest will accrue at 3% per annum for the first five years; 6% per annum after 3% ceases to be effective. Monthly payments shall be made on the first day of the next following October and continuing on the first day of each month thereafter of at least two per cent of the amount of the principal balance on the June 30th next prior to the date on which the first such monthly payment becomes due.



Undergraduate Registration and Regulations

Registration

Students in residence are required to submit, not later than the date of the spring registration, cards showing their selection of courses for the following year. Evidence of the payment of the continuing preregistration deposit of \$25.00 is required before the card may be submitted. These cards, approved by the Dean, are filed for permanent record in the Central Records Office. Students who do not select their courses for the following year at the time appointed must be readmitted to the college by application to the Committee on Admissions. The same regulations, with the exception of the advance deposit, apply to registration for the spring semester.

Students who register in either semester at a date later than that prescribed must pay to the Treasurer a fee of \$5.00. They are counted as absent in the work they have missed in the professional courses to which they are admitted, and these absences carry the same penalty as do other absences from the professional courses. Changes in courses for reasons not arising within the University require a payment of \$1.00 for each change made. No course may be elected later than one week after the opening of the semester, and no student may be admitted to any class without an official enrollment.

Orientation Program

All Freshmen and transfer students are required to participate in the activities of Orientation Week. The program includes placement tests, orientation lectures, physical examinations, social events, special religious services, registration, and enrollment. New students who miss the whole or a part of the Orientation Program place themselves at a serious disadvantage at the very outset of their college career.

Health Regulations

Before admission to the School of Nursing, a student is required to have a physical examination by the family physician and to be immunized against typhoid fever, diphtheria, tetanus, smallpox, and poliomyelitis. Physical defects, such as defective vision, dental needs, etc., must be corrected before admission.

Before final acceptance, each student is required to undergo a physical examination under the School's direction during Orientation. Students whose condition needs further observation may be admitted tentatively, but must cancel their applications if findings prove them physically unable to pursue the program.

Course Requirements

The normal load of a student is four or five academic and professional courses during the first, second, and third years (exclusive of physical education) or six to nine semester hours per quarter during the fourth year. No student is permitted to take less than twelve semester hours of work per semester during the first, second, and third years or six semester hours per quarter during the fourth year or more than the normal load during any part of her program without special permission from the Dean.

Grading

Grades are reported to indicate the following:

Passed. A, B, C, and D are all passing grades. The letters are intended to indicate the following quality of work. A, exceptional; B, superior; C, average; D, low pass.

Failed. A grade of F indicates that the student has failed the course, and in order to receive credit for the course she must repeat the work in class.

Incomplete work. If because of illness or other emergency a student's work in a course is incomplete, she may receive an I for the course instead of a final grade. Incomplete courses must be completed before the close of the succeeding semester; otherwise the I is converted to an F and the course must be repeated in class if the student is to receive credit for it. In case a student whose work is incomplete is also absent from a final examination, she receives an X for the course.

Withdrawal. The letter W is used to indicate official withdrawal from a course. If a student drops a course without permission from the Dean, the grade for that course is recorded as F. If she drops with permission a course in which she is failing, the grade for that course is recorded as F unless, in the judgment of the Dean, circumstances do not justify this penalty.

Reports. Reports on proficiency in academic work are sent to parents or guardians after the examinations at the end of each semester. In addition, six-weeks advisory grade reports on freshmen are mailed each semester.

Credits

The term of credit used is the semester hour which signifies one class period a week throughout the semester. Two or four hours of laboratory work are equivalent to one hour of class work. Two semesters of seventeen weeks each or three quarters of twelve weeks each constitute the academic year. For the degree of Bachelor of Science in Nursing, credit for 132 semester hours is required.

Transfer Credits. Transfer credit, in which grades of C or above have been earned, is rated at two quality points per semester hour. Courses in which grades of less than C have been earned are not acceptable for credit.

Although credit for work completed at other institutions will be determined in relation to the curriculum requirements of the School of Nursing, an overall average grade of C on all previous work taken is required before consideration for advanced standing may be given.

A student who transfers with advanced standing to the School of Nursing from a junior college must be enrolled for at least one semester before transfer of credit will be accepted. Credit for courses in science offered for advanced standing by a transfer from a junior college will be determined by the departments concerned.

The maximum amount of credit acceptable from a junior college is 60 semester hours, exclusive of physical education. No credit is given for work completed by correspondence, and credit for no more than six semester hours is allowed for extension courses. Any extension work accepted must be approved by the dean.

Residence Requirements. The final two years of senior-level work in the School must be earned in residence. Students who meet this require-

ment but who still lack six or eight semester hours in final fulfilment of requirements may take this work in another institution of approved standing, provided the course is approved by the head of the department concerned and by the Dean.

Students who complete in a summer session the work required by the University for the degree will be granted the degree at the end of the

summer.

Quality Points and Class Standing

The requirements for the degree are computed in semester hours and in quality points. Quality points are determined by grades as follows: for an A, four quality points for each semester hour; for a B, three quality points for each semester hour; for a C, two quality points for each semester hour; for a D, one quality point for each semester hour; for an F, no quality points. Credit for at least 264 quality points is required for

the degree of Bachelor of Science in Nursing.

Requirements for Continuation in College and for Graduation from College. To continue in college and to graduate, students must, in addition to the requirements listed elsewhere in this Bulletin, pass a minimum number of semester hours, achieve a specified quality point ratio, and in the case of graduation earn a minimum number of quality points. The quality point ratio is calculated by dividing the accumulated number of quality points earned by the accumulated number of semester hours carried (not semester hours passed). These requirements are listed in the following table.

For continuation from The first to the second year The second to the third year The third to the fourth year The fourth to the fifth year (if needed)

The minimum requirement is 24 s.h. credit and a q.p.r. of 1.30 56 s.h. credit and a q.p.r. of 1.60 80 s.h. credit and a q.p.r. of 1.75 114 s.h. credit and a q.p.r. of 1.85

For graduation the minimum requirement is 132 semester hours, 264

quality points, and a quality point ratio of 1.9.

In addition to the qualitative standards listed above students must pass a minimum number of hours each semester. First year students must pass at least six semester hours of work in their first semester and eighteen semester hours in their first year exclusive of physical education; all other students must pass at least nine semester hours each semester. Third and fourth year students are expected to maintain a "C average" in nursing. The University may require a student whose record is considered unsatisfactory to withdraw, although the minimum requirements set forth in this paragraph have been met. Any student whose standing in the School of Nursing is below an acceptable level, in either academic or clinical courses, may be, after careful evaluation by the faculty, required to withdraw from the school.

Class Attendance Regulations

The attendance regulations specifically place the responsibility for class attendance upon the individual student. A student is expected to attend his classes regularly and punctually. It should be recognized that one of the most vital aspects of a residential college experience is attendance in the classroom, and that the value of this academic experience cannot be fully measured by testing procedures alone. The members of the student body are considered sufficiently mature to appreciate the necessity of regular attendance, to accept this personal responsibility, and to demonstrate the kind of self-discipline essential for such performance, and, conversely, to recognize and accept the consequences of failure to attend. Instructors are privileged to refer to the dean for appropriate action any student who in their opinion is causing his work or that of the class to suffer because of absences or latenesses.

Absences from classes due to illness will be excused when certified by a proper medical official. Absences from classes due to authorized representation of the University may be excused. Officials in charge of groups representing the University are required to submit names of those persons to be excused to the appropriate dean's office forty-eight hours in advance of the hour when their absences are to commence.

Eligibility for Academic Honors

Dean's List. In recognition of academic achievement, students who earn an average quality point ratio of 3.0 or higher on a semester's work of not less than the minimum academic load are placed on the Dean's list.

Class Scholars. A student in each class of the School of Nursing who achieves the highest quality point ratio on at least a normal course load

for each academic year shall be designated a Class Scholar.

Class Honors. To be eligible for Class Honors a student must earn, during the year, credit for at least the minimum academic load permitted by the college in which she is registered. All semester hours on which a student receives a grade are counted in the determination of Class Honors. Students in the freshman, sophomore and junior classes who earn a 3.50 quality point ratio are eligible for Class Honors.

Graduation Honors. To be eligible for consideration for Graduation Honors at graduation a student must have completed in residence a minimum of ninety semester hours. Students who earn an average of at least a quality point ratio of 3.50 are recommended for a degree magna cum laude. Those who earn a quality point ratio of 3.75 are recommended

for a degree summa cum laude.

Conduct and Discipline

The University expects of its students loyal and hearty cooperation in developing and maintaining high standards of conduct as well as of scholarship. General University regulations concerning conduct of students will be made available to students when admission is offered, or under other circumstances, upon request. The student in accepting admission indicates a willingness to subscribe to those regulations. The University therefore reserves the right, and matriculation by the student is a concession of this right, to ask the withdrawal of any student whose conduct at any time is not satisfactory to the University.

General oversight of the conduct of students and the administering of discipline are under the supervision of the Vice President in the Division of Student Life. Immediate supervision is entrusted to the Dean. However, through the expressed willingness of the students of the University to assume the responsibility of maintaining high standards of morals and honor, the student body has properly become to a great degree selfgoverning. The duly elected representatives of the student body, exercise the authority granted the students to investigate all cases of misconduct, as well as all other cases of violation of proper student standards and traditions, and to make recommendations of penalties based on their findings. They exert a guiding and stimulating influence for the promotion of high ideals of conduct and of student relationships.

Motor Vehicles

Freshmen are not advised to own or operate motor vehicles at the University. Members of the upper classes may operate motor vehicles, however, when in accordance with University regulations.

Each student possessing or maintaining a motor vehicle at Duke University shall register it annually at the beginning of the fall semester. If a student acquires a motor vehicle and maintains the same at Duke University after registration, he must register it within five (5) calendar days after operation on the campuses begins. Resident students are required to pay an annual parking fee of \$30.00 for each motor vehicle, excepting that a parking fee of \$10.00 is required for each motorcycle, motorbike, or motor scooter.

At the time of registration of a motor vehicle, the following documents must be presented:

- 1. State vehicle registration certificate.
- 2. Valid driver's license.
- 3. Satisfactory evidence of automobile liability insurance coverage with



limits of at least \$5,000.00 per person and \$10,000.00 per accident for personal injuries, and \$5,000.00 for property damage as required by North Carolina Motor Vehicle Law.

4. If the student is under 21, a statement signed by the student's parent or guardian granting the student permission to operate a motor vehicle at Duke University.

Undergraduate Courses of Instruction

For description of courses to fulfill elective requirements refer to the *Bulletin of Undergraduate Instruction*.

Required Undergraduate Courses

English

1-2. Freshman Composition. Training in composition through the writing of weekly expository themes. The theme subjects derive from assigned reading drawn from British and American literature of the 20th Century. English 1 takes up the Essay, the Short Story, and the Novel; English 2, the Play and the Poem. The student attends each week (1) a general lecture on the reading for the week; (2) a section meeting, where the instructor and a small group discuss problems of composition and literature; and (3) an individual conference in which the instructor reads and grades the weekly theme and makes special assignments according to the needs of the student. 6 s.h. Staff

Physical Education

Required Physical Education. Two semester hours of physical educa-

tion are required and normally completed in the first year. Students may elect activities in sports or dance with the possibility of four different

choices in the year's requirement.

At the beginning of the freshman year, each student is tested in posture, sports fundamentals, and swimming. For those whose test scores are low, remedial courses in these basic skills are suggested. A swimming course is required for those who do not pass the elementary swimming test. McCue, Bookhout, Lewis, Eddy, Holton, Lloyd, Spangler, Woodyard, Wray, and Raynor

Psychology

91. Introductory Psychology. An introduction to the facts, principles, and problems of normal adult psychology through a study of psychological methods as applied to motivation, emotions, perception, sensation, thinking, memory, learning, individual differences, and personality. 3 s.h. Staff

116. Psychology of Personality. A comparative study of personality theories, with an emphasis upon personality structure, dynamics and development. Therapeutic activities in relation to specific personality

theories will be discussed. 3 s.h. Crovitz

Sociology

91. Introduction to Sociology: Concepts and Procedures. Concepts and procedures of sociology and illustrations of their use in understanding

specific areas of social life. 3 s.h. Open to Freshmen.

150. The Family. Analysis of the American family as an institutionalized group and its relationship with other institutions and structural features such as social class and ethnic group. Special attention is devoted to methods of research in this area. 3 s.h. Kerckhoff

Nursing and Nursing Related Sciences

N 1-2. Interpersonal Relations in Nursing. This is an introductory course which is designed to assist the student in further developing concepts and skills that are basic to competence in interpersonal relations and nursing therapy. The student begins to define and amplify her concepts of the role of the professional nurse. Content of the course is based on the belief that a conscious possession of interpersonal concepts and goal directed behavior is basic to professional management of nurse-patient situations. A limited number of supervised short interviews with inpatients is arranged. 4 s.h. Dunham, Culver, and Staff

N 4. Microbiology. A survey of the principles and techniques of microbiology and immunology with special emphasis on their applications to Nielsen nursing. 3 s.h.

N 50. Chemistry. A course in the fundamentals of general chemistry with particular emphasis on introduction to organic chemistry. 3 s.h.

Thiers and Bernheim

N51. Introduction to Biochemistry. This course is designed to aid the student in understanding the chemical mechanism of the human body both in health and in disease. The student also acquires knowledge concerning the chemical basis of diagnosis and therapy. 3 s.h. Bernheim

N 52. Human Anatomy and Physiology. A study of the normal structure and functions of the human body. 4 s.h. Tosteson, Rankin and

Staff

N 53. Normal and Therapeutic Nutrition. Food needs are studied of individuals throughout the life cycle and within the spectrum of health, acute and chronic illness. Some accepted principles are presented on which dietary modifications are based, as are current practices based on

these principles. 3 s.h. McLachlan, Graham and Staff

N 91-92. The Fundamentals of Nursing. A study of the fundamentals of nursing aimed at presenting the student with a basic knowledge and understanding of the principles and skills of nursing care. The student has correlated experiences in patient care and has the opportunity to participate in patient-centered conferences. Both of these are designed to assist her in the process of integrating the concepts of the behavioral and natural sciences in her approach to solving nursing care problems. Emphasis is placed upon the beginning development of the role of the nurse and upon nurse-patient relationships. N g1 is offered in the Fall semester and N 92 in the Spring semester. Each course has three semester hours of lecture, two semester hours of lecture-discussion and one semester hour of clinical laboratory experience. 6 s.h. each semester. Gover, Nolan, Craig, Straub, Phillips, and Fogleman

N 120. Pediatric Nursing. Designed to help the student acquire the basic knowledge, understanding, and nursing skills necessary for the promotion of comfort, health, and safety of children. Focus is on child care and the nurse-child-family relationship. 6 s.h. Horton and Schwab

N 130. Obstetric Nursing. Designed to help the student acquire the basic knowledge, understanding, and nursing skills necessary for the promotion of comfort, health, and safety of the mother and newborn infant during the reproductive experience. 6 s.h. Horton, Proctor, Hogue

N 141. Medical-Surgical Nursing Theory. 5 s.h.

N 142. Medical-Surgical Nursing Practicum. 4 s.h.

These courses are designed to assist the student in acquiring knowledge and developing skills basic to identifying and meeting the nursing needs

of adult patients with health problems that require medical-surgical intervention. Experiences are planned to increase the student's understanding of the need for continuity of nursing care and to enhance her ability to implement this as she cares for patients in various medical and surgical settings. These courses must be taken concurrently, and both must be completed satisfactorily in order to receive credit for either course. Crane, Lawrence, Norville, Kintzel, and Kennedy

N 155. Social Forces and Community Health. Analysis of community action designed to alleviate universal health, welfare and educational problems. Demonstrate the concomitance of social, economic and cultural patterns with social legislation. Course is to be taken concurrently with

Ñ 141-N 142. 3 s.h. Slome

N 160. Social Foundation of Nursing. A survey of major historical, philosophical, and sociological factors which have affected Nursing and Nursing Education. The purpose of the course is to give the student a better understanding of the place of nursing in present day society and the responsibilities of the individual nurse to society. 3 s.h. Jacobansky and Burch

N 170. Psychiatric Nursing. This course focuses on dynamic psychiatric nursing. It is taught within the frame of reference of interpersonal theory, communication theory, problem solving process and dynamic psychiatry. It provides opportunities for learning under supervision through experiences in a one-to-one relationship with a hospitalized psychiatric patient. Phillips, Bullock, and Grim

N 171. Psychiatric Nursing Group Work. This is an honors elective course designed to provide knowledge of basic concepts and principles related to dynamics of small group functioning. It provides opportunity for experimental learning as a group member and for experiences as a group leader with a small group of psychiatric patients. 1 s.h.

N 180. Public Health Science. This course provides students with a basic knowledge of the field of Public Health. Included is an introduction to Public Health Administration, Environmental Science, Biostatistics, and Epidemiology. It provides an opportunity for students to become familiar with the scientific method used in Epidemiology. 3 s.h.

Prerequisite to N 181 Hester and Visiting Lecturers

N 181. Public Health Nursing. Students acquire knowledge of the philosophy, principles, and processes of nursing as applied in Public Health setting. They have the opportunity to apply this knowledge through selected learning experiences in the Durham community. 6 s.h.

Persing, Young, and Hester

N 191. Team Leadership and Intensive Nursing Care. The course is designed to assist the student to use concepts of administration in a team leadership role, to increase her competency in complex nursing care and to apply simple scientific methodological skills to the selection and systematic investigation of a problem in nursing. 6 s.h. Fortune, Minniear, and Davenport

The Graduate Program in Nursing

Philosophy and Purpose

The degree offered is a Master of Science in Advanced Nursing. The philosophy of the program is predicated on certain beliefs.

Graduate education in nursing should have as its major focus, nursing, especially as related to scientific practice of nursing. Graduate education, per se, should provide opportunity for independent study of such nature that the individual will develop depth of judgment, perspective, and a broad comprehension of the problems facing our world. It should be personal and individualized. The student should become accustomed to a methodology that will provide for movement within the profession as the needs of society change because of new discoveries and innova-

Therefore, the emphasis is the exploration of the theoretical foundation for nurse practice based on scientific processes. The approach will be the use of a limited area of knowledge to increase understanding. This area of knowledge is determined by the student in relation to personal interest and ultimate goals and is to be related throughout the curriculum.

The ultimate product, it is hoped, will be one who questions knowledge, searches for new insights and relationships, and has a zest for continued learning, especially relative to nurse practice. It is hoped that having acquired a strong theoretical base, individuals will be able to innovate and to apply principles to new nursing problems as such

The individual may be prepared as a nurse specialist in the area of her choice or as a teacher of nursing, depending on course selections.

Admission

Requirements

- 1. Completion of an NLN accredited baccalaureate degree program in nursing which prepares for professional practice in all fields of nursing. (Provisional admission may be granted to applicants not fully meeting this requirement.)
- 2. A record of undergraduate study that meets general standards for admission to graduate study at Duke University.
- 3. Registration for the practice of nursing in a state.
- 4. Two recommendations from persons who are acquainted with the applicant's professional ability and capacity for graduate study.

In addition, the individual is encouraged to submit scores from the Graduate Record Examination. A personal interview is desirable. The applicant should be in good health. A physical examination is made during the registration period.

Procedure

Application, official transcripts of all undergraduate and graduate work, two letters of reference, and Graduate Record scores, if available, should be mailed to Director of Graduate Studies, School of Nursing, Duke University, Durham, North Carolina 27705, not later than June 1, by those applying for the fall semester; before May 12, for admission to the first term of summer; and before June 18, for admission to the second term. It is the student's responsibility to make certain that her application is complete and in order before the dates specified.

When the application is approved, the student will receive a letter of admission. The process of admission is not complete until a statement of

acceptance has been returned by the applicant.

Applicants who are admitted will be offered either full admission or provisional admission. Provisional admission to one semester or a minimum of 12 hours of course work is offered to students who do not fully comply with admission requirements but appear to warrant admission. Graduate credit earned under provisional status may be applied toward an advance degree at Duke University if and when, upon review. the student is granted full admission.

The emphasis in the program is the exploration of the theoretical foundation for nurse practice based on scientific processes. Freedom of curriculum selection to permit area of concentration in relation to individual interests and capabilities is encouraged. Courses are selected in relation to individuals' ultimate goals.

The core content provides the individual an opportunity to familiarize herself with scientific methods relating to nurse practice, to design nursing research projects, and to begin to develop nursing practice theory in a selected area.

Twenty-one units make up the core requirements. The remaining seventeen units provide the individual an opportunity to elect courses related to her area of concentration.

Throughout the year, focus will be on clinical practice; therefore, the student will use the laboratories located in the medical complex in relation to selected explorations of the nursing focus and its effectiveness in patient care.

The program of study covers two semesters and the full summer ses-

sion. Students are admitted in the fall of each year.

The required courses are:

	Units
N 250–251 Human Behavior and Psychophysiology*	4
N 261-262 Development of Nursing Theory	6
N 265 Methods of Research in Nursing	3
N 269 Thesis Research	3
N 290 Statistical Inference	3
N 311 Seminar in Selected Nursing Problems	2
Total	21

°M 261–262 Human Physiology (May be substituted if individual meets prerequisites)

Though the student may prepare as a nurse specialist in the area of her choice, special emphasis is placed on GERONTOLOGICAL NURSING. In preparation for this nursing specialty examples of elective courses available are:

Sociology 278 Social Structure and the Life Cycle, The Aged. Process of Aging.

Psychology 237 Functional Neurophysiology

Psychology 238 The Electroencephalogram and Psychological Function

Psychology 239 Behavioral Correlates of Brain Damage in Man

Psychology 254 Personality Development

Human Behavior-Cerebral Dysfunction

If the student elects to become a TEACHER OF NURSING, a related course

in psychology or education is selected each semester and summer term. Examples of selection are:

Education 217 The Psychological Principles of Education Education 333 Seminar in Higher Education

Under a plan of cooperation between the University of North Carolina and Duke University, students regularly enrolled in the Graduate Schools of the University during the regular academic year, and paying full fees to that institution, may be admitted to a maximum of two courses per semester in the Graduate School of Duke University upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. Under the same arrangements, students in the Graduate School of Duke University may be admitted to course work at the University of North Carolina. A similar arrangement is effective in the Summer Session.

Requirements for Degree

The following requirements are necessary for the Master of Science Degree in Nursing:

1. Satisfaction of subject matter deficits in undergraduate study that have resulted in provisional admission to graduate study.

2. Matriculation for the Degree of Master of Science in Nursing upon satisfactory completion of the initial 12 units of graduate work and the approval of the Director of Graduate Studies.

3. Satisfactory completion of the program of studies.

4. Passing of comprehensive examination.

Academic Regulations

Registration

All students who enter course work for credit and all students who have completed minimum requirements for an advanced degree but continue to use the facilities of the University in their research must complete the registration procedures.

After the applicant has received notification of admission and has submitted a statement of acceptance of admission, she is eligible for registration. All students are expected to register at the time stated. Those registering later are subject to a late registration fee of five dollars.

Change of Registration. During the academic year within a period of fourteen days from the specified day of registration, students may change their schedules with the approval of the Director of the Graduate Program.

Course Requirements and Credits

Although ideally graduate study is principally individual reading, research, and laboratory experimentation under guidance, academic progress in the United States is generally measured and recorded in terms of course hours and credits. Peculiar to graduate study is the term residence, also generally measured in hours, to designate individual study apart from courses, such as writing a thesis and preparing for general examinations. Since September, 1959, in this University, graduate credit for courses and seminars, research, and residence, and corresponding tuition and fees have been stated in terms of units. According to conventional measurement one unit is equivalent to one semester hour. Thus a course previously described as carrying a credit of 3 s.h. now carries a credit of 3 units.

Normally, graduate students who do not carry teaching or assisting duties carry a full load of graduate work until the requirements of the

degree are met.

Courses Primarily for Undergraduates. Students granted provisional admission may on occasion be required to take, as part of their program, undergraduate courses as prerequisites to continued graduate study. Undergraduate courses thus taken and others elected by the student will carry no graduate credit.

In exceptional cases, 100-level courses outside the major department may be taken for graduate credit to a maximum of two one-semester courses or one year course not exceeding a total of 8 units, when approved by the Director of the Graduate Program in the major department and

in the department in which the course is listed.

Residence Requirements. Candidates for the Master's degree must spend, as a minimum, one calendar year at Duke University. Often more time will prove necessary depending upon the nature of the student's

program of studies.

Transfer of Graduate Credits. Under certain circumstances a maximum credit of 6 units may be allowed for graduate courses completed elsewhere. The acceptance of credit up to this amount, however, will not reduce the minimum period of full-time registered residence at Duke University.

Grading

Grades in the Graduate Program are as follows: E, G, S, F, and I. E (exceptional) is the highest mark. G (good) and S (satisfactory) are the remaining passing marks. F (failing) is below passing, and I (incomplete) indicates that some portion of the student's work is lacking, for a

satisfactory reason, at the time the grades are reported. The instructor who gives an I for a course specifies the date by which the student must have made up the deficiency. In no case may an extension be granted beyond one calendar year from the date the course ended. If the course is not completed, a statement of No Credit is made upon the student's record.

Time Limits for Completion of Master's Degrees

The candidate for the Master's degree who is in residence for consecutive academic years should complete all requirements for the degree within two calendar years from the date of her first registration in the Graduate Program. Any candidate must complete all requirements within six calendar years of her first registration. Credits earned over a longer period of time cannot be credited toward a degree.

Withdrawal and Interruption of Program

From a course. After 14 days from the date of registration students may drop courses only with the approval of the Director of the Graduate Program, the instructor of the course to be dropped, and the Dean of the School of Nursing. If the course is dropped without the necessary approval, the permanent record will list the course as Dropped Unofficially, F. If a course is dropped 30 days or more after the beginning of the class for the semester involved, the status of the student at the time of withdrawal from the course will be determined and indicated by the designation Withdrew Passing (W.P.) or Withdrew Failing (W.F.)

From the School. The University reserves the right, and matriculation by the student is a concession of this right, to ask the withdrawal of any student whose conduct at any time is not satisfactory to the University. If a student wishes for any reason to withdraw from the School she should notify both the Director of the Graduate Program and the Dean of the School prior to the date of her expected withdrawal.

Students who find it necessary to interrupt their program of study for a period longer than a summer vacation should, before departure, provide in writing a statement of the reason for interruption, mailing address, and expected date of return.

Nonacademic Regulations

Motor Vehicles

Every motor vehicle operated on the campus by students enrolled in Duke University must be registered at o8 Social Science within five days after arrival and thereafter must display the proper decal emblem. To register a vehicle, the student should present the following documents: (1) state vehicle registration, (2) state operator's license, (3) evidence of automobile liability insurance as required by North Carolina law (\$5,000 per person, \$10,000 per accident for personal injuries; \$5,000 for property damage). There is a registration fee of \$30.00 for each automobile and \$10.00 for each motorcycle, motor bike or motor scooter operated on the campus.

Fees and Expenses

Tuition and General Fees

The following tables show the general fees and charges collected from all students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration for that semester. No student is admitted to classes until arrangements have been made with the Treasurer of the University for the settlement of fees.

Tuition and fees for a full semester program of 16 units amount to \$818.50. For a part program in the regular semesters, tuition and fees are computed at the rate of \$50.00 per unit plus \$5.00 fee for each course. Tuition and fees for course work in the Summer Session are computed at the rate of \$40.00 per unit. Federal traineeships are available for a selected number of qualified applicants.

Special Fees for Teachers and Others

The University recognizes a special obligation to encourage the following types of students in their professional and personal advancement: (1) members of the faculties of the neighboring public schools and colleges, currently engaged in full-time teaching while taking courses in the Graduate School, (2) ministers of neighboring churches, (3) wives of Duke faculty members, (4) full-time employees of Duke University (who have held that status for two years) who are paid on a monthly basis throughout the year. The reduced fees do not apply to teachers and ministers while on leave of absence, nor to holders of fellowships, scholarships, or graduate and research assistantships, nor to part-time instructors.

Persons eligible for the reduced fee must meet the admission standards required of all graduate students and must be admitted to the Graduate program. They may enroll for one or two courses per semester (in no case totaling more than 7 units) upon payment of a fee of \$5.00 for registration for each semester and a tuition fee of \$25.00 per unit of credit or

an audit fee of \$20.00 per course. The in absentia fee will not be charged at this rate.

Living Accommodations

Housing

The graduate student in the School of Nursing may apply for one of

the following types of accommodations:

The Graduate Center Women's section. The Graduate Center houses 310 graduate men and 60 women in a section established within this residence hall. Men and women share the commons facilities on the main floor and the dining facilities on the ground floor. The rental rate per student is \$310.00 for the academic year.

Hanes Annex: The first floor of this residence hall is reserved for graduate women and paramedical students. The commons areas are shared with seniors in the School of Nursing who occupy the entire second floor. The rental rate per student is \$335.00 (double occupancy) for the

academic year.

Town House Apartments: Twenty-six furnished, air conditioned apartments have been basically equipped for three women each. Each apartment has a living room, kitchen, a master bedroom. Household equipment such as kitchenware, cleaning equipment, etc., is not provided. No effort is made to assign the bedrooms; this is left to the three occupants. The rental rate per person is \$450 for the academic year for each occupant.

Graduate Students in the School of Nursing should write directly to the Director of Housing for detailed information concerning graduate housing, application procedures, rental rates, and other pertinent infor-

mation.

Rooms and space in the apartments are rented for a period of not less than one semester unless special arrangements are made through the Housing Bureau after official acceptance for admission to the University. Students may arrange for apartments or rooms in private homes in the city. The Housing Bureau of the University maintains a file of rooms and apartments listed with it for rental. Students may use this file as an aid to locating suitable living accommodations.

Food Services

Food service on both the Woman's College Campus and the West Campus is cafeteria style. The dining facilities on the West Campus include three cafeterias with multiple-choice menus, a grill, and, in addition, the Oak Room where full meals and a la carte items are served. The Men's Graduate Center has a cafeteria open at meal hours, and a coffee lounge which is open until 11:00 p.m. The prices are the same as in the West Campus Union. Because of the large number of those served in the dining halls, it is not possible to arrange special diets for individual students.

Services Available

Medical Care

The complete medical facilities of the Duke University Medical Center are available to all members of the University community. To secure the benefits of the Student Health program, a graduate student during the term or semester in which the illness occurs must (1) in the Summer Session term be registered for at least 3 units, (2) prior to completing minimum residence requirements be registered for at least 9 units per semester. Students are not covered during vacations and their dependents and members of their family are not covered at any time. Care is provided at the Health Office in Hanes House.

The service provided includes hospitalization in Duke Hospital, when recommended by the Hospital staff, to a limit of thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Students pay for board while in the hospital. Excluded from the service are refraction of eyes, treatment of teeth and of all chronic and pre-existing conditions, and elective surgery.

Graduate students are urged to carry adequate health insurance to supplement Student Health Program services. If students have insurance providing hospitalization, surgical, or medical benefits, the benefit shall be

applied to the cost of their medical care.

Recreational Facilities

Graduate students new to Duke University may be reminded that they are welcome to use such recreation facilities as swimming pools, tennis courts, golf course, and to affiliate with choral, drama, and religious groups. They may become junior members of the American Association of University Professors.

School of Nursing Graduate Courses

N 250-251. Human Behavior and Psychophysiology. Presents the current theory of psychophysiology with the aim to develop deepened appreciation of the personality-illness relationship and of the influence of

psychological factors in the genesis of somatic reactions and of somatic disease. (4 units) Reckless

N 261-262. Development of Nursing Theory. Concerned with an explanation of bases for nursing practice (Intuition, Imitation, Emperic). An overview of scientific practices as related to the nursing process. Examination of techniques of theory construction. Individuals develop hypothesis and test such in clinical settings as an introduction to the development of nursing theory. First semester concentrated on theory construction. Second semester, the testing of hypothesis in clinical laboratories. (6 units) Professor Stone and Faculty

N 265. Methods of Research in Nursing. An overview of research in nursing. Exploration of nature of research process. (3 units) Stone

N 269. Thesis Research. Development of a research in nursing under

direction of the faculty. (3 units)

N 290. Biostatistics. The basic elements of statistical inference with specific emphasis on problems in medical and biological fields. Designed to provide an introduction to some of the methods of modern statistical analysis and their use in making inferences from data collected in surveys and in the laboratory. Topics will include: probability and probability distributions, confidence interval estimation and hypothesis testing including some elementary distribution—free techniques, analysis of variance, correlation and regression and a brief introduction to the use of the computer in data storage, retrieval and analysis. Prerequisite: permission of instructor. (3 units) Ofallon

N 311. Seminar in Selected Problems. (2 units)

The Summer Session

The programs in the School of Nursing include courses in the Summer Session each year. Students in the School of Nursing have their courses approved in the School of Nursing and pre-register with the Summer Session office. Students from other colleges and universities who are admitted to the School of Nursing with advanced standing may be required to enroll in the Summer Session to make up deficiencies. Arrangements for registration are made through the office of the Dean of the School of Nursing.

The Summer Session of 1967 will include two terms: Term I, June 12, to July 18; Term II, July 20, to August 25. By attending both terms it is possible for a student to earn as many as twelve semester hours of credit.

While the basic purpose of the Summer Session is to serve the academic and the professional requirements of those who are interested in their own educational advancement, the University recognizes the need of, and provides for, a varied recreation program both athletic and social.

University fees for Summer Session 1967 will be charged at the rate of \$40.00 per semester hour for those admitted with advanced standing. Board for resident students is charged at the rate of \$85.00 for each term of Summer Session; a double room is \$47.50 per person for a term of Summer Session. The cost of laundry is approximately \$.50 per week. A bill is sent to all pre-registered students to permit payment in advance.





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BULLETIN OF DUKE UNIVERSITY

The School of Law 1967



Annual Bulletins

For Bulletin of Information for Prospective Students, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The School of Engineering, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to The Dean of the Divinity School, Duke University, Durham, N. C.

For Bulletin of The School of Forestry, apply to The Dean of the School of Forestry, Duke University, Durham, N. C.

For Bulletin of The Graduate School of Arts and Sciences, apply to The Dean of the Graduate School, Duke University, Durham, N. C.

For Bulletin of The School of Law, apply to The Dean of the School of Law, Duke University, Durham, N. C.

For Bulletin of The School of Medicine, apply to The Dean of the School of Medicine, Duke University, Durham, N. C.

For Bulletin of The School of Nursing, apply to The Dean of the School of Nursing, Duke University, Durham, N. C.

For Bulletin of The Summer Session, apply to The Director of the Summer Session, Duke University, Durham, N. C.

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BULLETIN OF DUKE UNIVERSITY

The School of Law 1967

Durham, North Carolina 1967



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Calendar of the Law School

1967

September

18 Monday—Registration day for first year students

19-20 Tuesday-Wednesday—Registration day for second and third year students

Thursday, 8:00 a.m.—Classes begin 21

November

Wednesday, 1:00 p.m.—Thanksgiving holidays begin

Monday, 8:00 a.m.—Classes resumed

December

Thursday-Friday-Registration for spring semester 14-15

Wednesday, 1:00 p.m.—Christmas recess begins

1968

January

Wednesday, 8:00 a.m.—Classes resumed 3

Friday, 6:00 p.m.—Fall semester classes end 12

Monday—Mid-year examinations begin 15

26 Friday—Mid-year examinations end

Monday, 8:00 a.m.-Spring semester classes begin 29

March

23 Saturday, 1:00 p.m.—Spring vacation begins

April

Monday, 8:00 a.m.—Classes resumed

May

11 Saturday, 1:00 p.m.—Spring semester classes end

13 Monday—Final examinations begin

28 Tuesday—Final examinations end

June

1 Saturday—Commencement begins

Monday—Graduating exercises 3

Officers of the University Administration

Edwin Constant Bryson, LL.B., University Counsel

Douglas Maitland Knight, Ph.D., LL.D., Litt.D., L.H.D., President R. Taylor Cole, Ph.D., Provost

Frank Leon Ashmore, A.B., Vice President for Institutional Advancement Gerhard Chester Henricksen, M.A., C.P.A., Vice President and Treasurer Everett Harold Hopkins, M.A., LL.D., Vice President for Planning and Institutional Studies

Charles B. Huestis, Vice President for Business and Finance
Frank Traver de Vyver, Ph.D., Vice Provost
Harold W. Lewis, Ph.D., Vice Provost
Richard Lionel Predmore, D.M.L., Vice Provost
Barnes Woodhall, M.D., Vice Provost
Craufurd David Goodwin, Ph.D., Assistant Provost
Robert H. Ballantyne, Ed.D., Assistant to the President for Planning
Benjamin Edward Powell, Ph.D., Librarian
Richard Lovejoy Tuthill, Ed.D., University Registrar
Rufus H. Powell, LL.B., Secretary of the University

Law Faculty and Administration

Hans W. Baade, A.B., LL.B., LL.M., Dr.iur., Diplomé de Droit International, *Professor of Law*; *American Editor*, Journal of Business Law.

A.B. 1949, Syracuse University; Dr.iur. 1951, University of Kiel, Germany; LL.B., LL.M. 1955, Duke University; Diplomé 1956, Hague Academy of International Law. Assistant, 1955, and Referent, 1956-1960, Institute of International Law, University of Kiel, Germany. Associate Professor of Law, Duke University, 1960-63; Professor of Law, since 1964.

W. Bryan Bolich A.B., B.A. (Juris.), M.A., B.C.L., Professor of Law Emeritus

A.B. 1917, Duke University; Duke University Law School, 1919-1921; B.A. (Juris.), 1923, B.C.L. 1924, M.A. 1928, Oxford University. General practice, 1924-1927; Member North Carolina House of Representatives, 1927; Legal Attaché American Embassy, Rome, 1950; Visiting Professor of Law, University of North Carolina, Summer 1951, 1955; University of Houston, Spring Semester 1957; Professor of Law, Duke University, 1927-1966; Professor of Law Emeritus, since 1966.

John S. Bradway, A.B., A.M., LL.B., LL.D., Professor of Law Emeritus

A.B. 1911, A.M. 1915, LL.D. 1957, Haverford College; LL.B. 1914, University of Pennsylvania. General practice, 1914-1929; Legal Aid Society of Philadelphia, 1914-1920; Chief Counsel, Philadelphia Legal Aid Bureau, 1920-1922; Secretary, National Association of Legal Aid Organizations, 1923-1940; President, 1940-1942; Visiting Professor of Law and Director of the Legal Aid Clinic, University of Southern California, Summer 1928; Professor of Law and Director of the Legal Aid Clinic, University of Southern California, 1929-1931; Vice-president, N.C. Bar Association, 1945-1946: Visiting Professor, University of North Carolina School of Social Work, 1949-1959. Professor of Law and Director of the Legal Aid Clinic, Duke University, 1931-1959; Professor of Law Emeritus, since 1959.

Edwin C. Bryson, LL.B., Professor of Law

University of North Carolina, 1922-1925; Duke University, 1932-1933; LL.B. 1937, University of Oregon. General practice, 1927-1930. Assistant in Duke University Legal Aid Clinic, 1931-1947; Duke University Counsel since 1945. Associate Professor of Law 1947-1954; Professor of Law, since 1954.

George C. Christie, A.B., LL.B., Diploma in International Law, Professor of Law

1962, Cambridge University. General practice, 1958-1960; Ford Fellow, Harvard Law A.B. 1955, LL.B. 1957, Columbia University; Diploma in International Law, School, 1960-1961; Fulbright Scholar, Cambridge University, 1961-1962; Associate Professor of Law, University of Minnesota, 1962-1965; Professor of Law, University of Minnesota, 1965-1966; Assistant General Counsel for the Far East and Southeast Asia, Agency for International Development, 1966-1967. Professor of Law, Duke University, since 1967.

Richard W. Duesenberg, B.A., LL.B., LL.M., Professor of Law

B.A. 1951, LL.B. 1953, Valparaiso University; LL.M. 1956, Yale University. Assistant Professor of Law, New York University, 1956-1959; Associate Professor of Law, New York University, 1959-1962. Director, Law Center Publications Office, New York University, 1961-1962; Member, American Law Institute, since 1966; Corporate counsel, since 1962. Professor of Law, Duke University, since 1967.

Robinson Oscar Everett, A.B., LL.B., *Professor of Law*; Co-Editor, Law and Contemporary Problems

A.B. 1947, LL.B. 1950, Harvard University. Assistant Professor of Law, Duke University, 1950-1951; Military Service, Legal Officer in Air Force, 1951-1953; Commissioner of the U.S. Court of Military Appeals, 1953-1955; general practice, since 1955. U.S. Senate Subcommittee on Constitutional Rights of the Committee on the Judiciary, Counsel, 1961-1964, Consultant since 1966; Commissioner on Uniform Laws, since 1962; Consultant to Office of Economic Opportunity, since 1965; Member, American Law Institute, since 1966. Visiting Associate Professor of Law, Duke University, 1956-1961; Adjunct Professor of Law, 1961-1966; Professor of Law, since 1967.

Ernest Gellhorn, B.A., LL.B., Associate Professor of Law

B.A. 1956, LL.B. 1962, University of Minnesota. United States Navy, 1956-1959; general practice, 1962-1966; Associate Professor of Law, Duke University since 1966.

Paul Hardin, III, A.B., LL.B., Professor of Law

A.B. 1952, LL.B. 1954, Duke University. General practice, 1954; Military Service, 1954;1956; general practice, 1956-1958; Visiting Professor of Law, University of Texas, Summer 1960, University of Pennsylvania, 1962-1963. Ford Foundation summer research fellowships; Scotland, 1962; Jamaica, 1963; Canada, 1964; Nigeria, 1965. Assistant Professor of Law, Duke University, 1958-1961; Associate Professor of Law, 1961-1963; Professor of Law, since 1963.

Anthony S. Harrington, A.B., LL.B., Assistant Dean

A.B. 1963, University of North Carolina at Chapel Hill; LL.B. 1966, Duke University. Assistant Dean, Duke University, since 1966.

Clark C. Havighurst, A.B., J.D., Associate Professor of Law; Editor, Law and Contemporary Problems

A.B. 1955, Princeton University; J.D. 1958, Northwestern University. Military Service, 1958-1960; Research Associate, Small Business Studies, Duke University, 1960-1961; general practice, 1961-1964. Associate Professor of Law, Duke University, since 1964.

John D. Johnston, Jr., A.B., LL.B., Associate Professor of Law and Assistant Dean

A.B. 1954, LL.B. 1956, Duke University. Private business, 1956-1958; general practice, 1959-1962. Assistant Dean and Assistant Professor of Law, Duke University, 1962-1964; Associate Professor of Law, since 1965.

Arthur Larson, A.B., M.A., B.C.L., J.D., D.C.L., LL.D., L.H.D., Professor of Law and Director of Rule of Law Research Center

A.B. 1931, LL.D. 1953, Augustana College; M.A. (Juris.) 1938; B.C.L. 1957, D.C.L. 1957, Oxford University; Fellow of Pembroke College, Oxford. General practice, 1935-1939; Assistant Professor of Law, University of Tennessee, 1939-1941; Division Counsel, Office of Price Administration, 1941-1944; Chief, Scandinavian Branch Foreign Economic Administration, 1944-1945; Associate Professor, Cornell Law School, 1945-1948; Professor of Law, Cornell Law School, 1948-1953; Fulbright Fellowship, London School of Economics, 1952; Dean, University of Pittsburgh Law School, 1953-1954; Under-Secretary of Labor, 1954-1956; Director, U.S. Information Agency, 1956-1957; Special Assistant to the President 1957-1958; Special Consultant to the President 1958-1961; Consultant to the President on Foreign Affairs, since 1964; Consultant to the Senate Department on International Organizations, since 1963. Professor of Law and Director of Rule of Law Research Center, Duke University, since 1958.

Elvin R. Latty, B.S., J.D., J.Sc.D., William R. Perkins Professor of Law and Dean Emeritus

B.S. 1923, Bowdoin College; J.D. 1930, University of Michigan; J.Sc.D. 1936, Columbia University. Instructor in Romance Languages, University of Vermont, 1923-1927; general practice, 1930-1933; Special Fellow, Columbia University, 1933-1934; Associate Professor of Law, University of Kansas, 1934-1935; Professor of Law, University of Missouri, 1935-1937; Visiting Professor of Law, George Washington University, Summer 1937; Stanford University, Summer 1938; University of North Carolina, Summer 1942, 1947, 1949, 1956; University of Texas, Summer 1951; Fulbright lecturer, University of Pavia, Italy, 1954; Special Assistant to the American Ambassador, Caracas, 1942-1943; Acting Assistant Chief, Foreign Funds Control Division, U.S. Department of State, 1943. Professor of Law, Duke University, 1937-1966 and Dean of School of Law, 1958-1966; William R. Perkins Professor of Law and Dean Emeritus, since 1966.

Charles H. Livengood, Jr., A.B., LL.B., Professor of Law

A.B. 1931, Duke University; LL.B. 1934, Harvard University. General Practice, 1934-1940; Regional Attorney for the Seventh Region, Wage and Hour Division, U.S. Department of Labor, 1940-1941; Chief of the Wage-Hour Section, Office of the Solicitor of Labor, 1941-1942; Lieutenant Commander, USNR, on active duty, 1942-1945; general practice, 1945-1948; Visiting Professor of Law, University of North Carolina, Summer 1948; George Washington University, Summer 1949, 1956; Fulbright Lecturer, University of Sydney, Australia, 1958-1959. Lecturer in Law, Duke University, 1946-1948; Associate Professor of Law, 1948-1951; Associate Editor, Journal of Legal Education, 1951-1952; University Marshal, 1953-1961; Professor of Law, since 1951.

Charles L. B. Lowndes, A.B., LL.B., S.J.D., James B. Duke Professor of Law

A.B. 1923, Georgetown University; LL.B. 1926, S.J.D. 1931, Harvard University. General practice, 1926-1927; Assistant Professor of Law, Georgetown University, 1927-1928; Professor of Law, Georgetown University, 1928-1930; Research Fellow, Harvard Law School, 1930-1931; Professor of Law, Georgetown University, 1931-1934, Visiting Professor of Law, University of North Carolina, Summers 1947, 1965; University of Michigan, Summer 1963; University of Florida, 1964-1965. Professor of Law, Duke University, since 1934.

Malcolm McDermott, A.B., LL.B., Professor of Law Emeritus

A.B. 1910, Princeton University; LL.B. 1913, Harvard University. General practice, 1913-1930; Dean and Professor of Law, University of Tennessee, 1920-1930; Visiting Professor of Law, University of Southern California, Summer, 1929; Legal

Consultant, Department of Defense, 1951. Professor of Law, Duke University, 1930-1954; Professor of Law Emeritus, since 1954.

Forest Hodge O'Neal, A.B., LL.B., J.S.D., S.J.D., Dean and Professor of Law

A.B. 1938, LL.B. 1940, Louisiana State University; J.S.D. 1949, Yale University; S.J.D. 1954, Harvard University. Associate Professor of Law, University of Mississippi 1945-1946; Professor of Law, University of Mississippi, 1946-1947; Acting Dean and Professor of Law, Walter F. George School of Law, Mercer University, 1947-1948; Dean, Walter F. George School of Law, Mercer University, 1948-1956; Professor of Law, Vanderbilt University, 1956-1959; Visiting Professor of Law, New York University, 1957-1958; University of Michigan, summer 1965; University of Minnesota, fall 1965. Professor of Law, Duke University, since 1959, and Dean of School of Law since 1966.

Joel Francis Paschal, A.B., LL.B., A.M., Ph.D., Professor of Law

A.B. 1935, LL.B. 1938, Wake Forest College; A.M. 1942, Ph.D. 1948, Princeton University. Instructor in Law, Wake Forest College, 1939-1940; USNR, 1942-1946; Instructor, Princeton University, 1946-1947; Research Director, North Carolina Commission for the Improvement of the Administration of Justice, 1947-1949; general practice, 1949-1954; Visiting Professor of Law, Duke University, 1952-1953; Visiting Professor of Law, University of North Carolina, Spring Semester 1956. Associate Professor of Law, Duke University, 1954-1959; Professor of Law, since 1959.

August Kenneth Pye, B.A., LL.B., LL.M., Professor of Law

B.A. 1951, University of Buffalo; LL.B. 1953, LL.M. 1955, Georgetown University. Professor of Law 1955-1966, Associate Dean, 1961-1966, Georgetown University. Professor of Law, Duke University, since 1966.

Melvin G. Shimm, A.B., LL.B., Professor of Law; Faculty Advisor, Duke Law Journal

A.B. 1947, Columbia University; LL.B. 1950, Yale University. 2nd Lt. FA (AUS), 1943-1946; general practice, 1950-1951; Counsel, Wage Stabilization Board, 1951-1952; Bigelow Fellow, University of Chicago Law School, 1951-1953; Editor, Law and Contemporary Problems, 1955-1961; Editor, Journal of Legal Education, 1955-1963; American Editor, Journal of Business Law, 1955-1961; Visiting Associate Professor of Law, New York University, Summer 1957; Visiting Professor, University of Southern California, Summer 1965; Faculty, Orientation Program in American Law, Princeton University, Summer 1966, Senior Legal Consultant, The Brookings Institution, since 1965. Assistant Professor of Law, Duke University, 1953-1956; Associate Professor of Law, 1956-1959; Professor of Law, since 1959.

Bertel M. Sparks, B.S., LL.B., LL.M., S.J.D., Professor of Law

B.S. 1938, Eastern Kentucky State College; LL.B. 1948, University of Kentucky; LL.M. 1949, S.J.D. 1955, University of Michigan. Special Agent, U.S. Army Counter Intelligence Corps, 1941-1945; Instructor of Law, New York University, 1949-1950, Assistant Professor of Law, 1950-1952, Associate Professor of Law, 1952-1954, Professor since 1954; Visiting Professor of Law, University of Michigan, summer, 1956; Visiting Professor of Law, University of Kentucky, summer, 1957. Visiting Professor of Law, Duke University, 1966-1967; Professor of Law, since 1967.

Dale F. Stansbury, B.S., LL.B., J.S.D., Professor of Law Emeritus

B.S. 1914, Valparaiso University; LL.B. 1917, Indiana University; J.S.D. 1929, Yale University. Sterling Research Fellow, Yale University, 1928-1929; Deputy Attorney General of Indiana, 1918-1924, 1928; general practice, 1925-1927; Professor of Law, Mercer University, 1929-1935; Dean and Professor of Law, Wake Forest College, 1935-1944; Professor of Law, University of Tennessee, 1944-1946. Professor of Law, Duke University, 1946-1961; Professor of Law Emeritus, since 1961.

John W. Strong, A.B., LL.B., Associate Professor of Law

A.B. 1957, Yale University; LL.B. 1962, University of Illinois; General Practice, 1963-1964; Assistant Professor of Law, University of Kansas Law School, 1964-1966. Visiting Assistant Professor of Law, Duke University, 1966-1967; Associate Professor of Law, since 1967.

William W. Van Alstyne, B.A., LL.B., Professor of Law

B.A. 1955, University of Southern California; LL.B. 1958, Stanford University; Certificate, Hague Academy of International Law, 1961. California Department of Justice, 1958; United States Department of Justice, 1958-1959; Assistant Professor, Ohio State University College of Law, 1959-1961; Associate Professor, 1964-1965; Visiting Associate Professor of Law, Duke University, spring semester 1964; U.C.L.A. summer, 1964; Senior Fellow, Yale Law School, 1964-1965. Professor of Law, Duke University, since 1965.

Lawrence G. Wallace, A.B., M.P.A., LL.B., Associate Professor of Law

A.B. 1952, M.P.A. 1954, Syracuse University; LL.B. 1959, Columbia University. U.S. Air Force, 1953-1955; Staff, Maxwell Graduate School, Syracuse University, 1956; general practice, 1959-1960; Law Clerk to Associate Justice Hugo L. Black, U.S. Supreme Court, 1960-1961. Assistant Professor of Law, Duke University, 1961-1964; Associate Professor of Law, since 1965.

Gerald T. Wetherington, A.B., M.A., LL.B., Visiting Assistant Professor of Law

A.B. 1959, University of Miami; M.A. 1960, University of Illinois; LL.B. 1963, Duke University. General Practice 1963-1964; Assistant Solicitor, Dade County, Florida 1964-1966. Visiting Assistant Professor of Law, Duke University, 1966-1967.

Visiting Lecturers in Law

Robert L. Dickens, M.S., C.P.A. Mortimer Edelstein, B.S., LL.B.

Research Associates—Rule of Law Research Center

Kazimierz Grzybowski, M.LL., D.LL., S.J.D. John W. Halderman, A.B., LL.B.

Luke T. Lee, B.A., M.A., LL.B., Ph.D.

Lucretia B. Duke, Administrative Assistant

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Katharine B. Day, B.S., Assistant Librarian in Charge of Acquisitions
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General Information

Law School: Its Purpose and Methods

The official name of the School is the Duke University School of Law, but it will be referred to in these pages as the Duke Law School or the Law School.

The Duke Law School derives historically from the School of Law of Trinity College, with its history of legal instruction beginning in the middle of the past century, antedating the Civil War. When, in the 1920's, Trinity College became Duke University, the Law School was completely reorganized. This reorganization culminated with the housing of the Law School on the new West Campus in 1930, when the character of the Duke Law School can be said to have been reshaped.

The curriculum of the Law School provides thorough preparation for the practice of law in any state, and its graduates have been admitted to the bar throughout the nation. Opportunities for specialization in partic-

ular branches of the law are afforded.

In carrying out the trust imposed by the indenture establishing the Duke Endowment, the Law School seeks to have the student acquire knowledge and comprehension not only of legal doctrine, but also of the judicial process and of the social, economic, and political problems with which law and lawyers must deal. The method of instruction employed compels analysis of judicial opinions and inquiry into the nonlegal as well as the legal considerations which underlie them. In appropriate courses, special consideration is given to the work of the legislative and administrative agencies of government. In recognition of the increasing importance of the role of the lawyer in representing private interests before government agencies and in government service, a broad program is offered in the public law field. Opportunity for creative student work is provided by seminar courses and supervised individual study and research.

Practical training is not left for the first years of practice. A carefully integrated series of courses is designed to give students actual experience in the work of lawyers. Legal research, writing courses, moot court work, and practical study of steps in law suits in the first and second years are followed in the third year by seminar courses emphasizing trial techniques, legal planning and drafting, and interdisciplinary approaches. A student bar association affords a means whereby the student may gain acquaintance with the professional organizations through which a lawyer may and should contribute to the well-being of his profession and society.

Courses of Study and Degrees Offered

Bachelor of Laws Degree

Upon favorable recommendation of the Faculty, the degree of Bachelor of Laws will be conferred on students who shall have successfully completed six semesters of law study, the last two semesters of work immediately preceding the granting of such degree having been completed in this School.

A student shall be deemed to have completed successfully six semesters of law study if during this period he has completed the following requirements:

- (1) secured a passing grade in courses aggregating 84 semester hours;
- (2) secured in every required course a grade not requiring repetition thereof; and
- (3) secured a weighted average at least five points above passing, whether computed by including or by excluding the grades in the firstyear courses.

Students who have spent only their last two semesters of study in residence in this School must have received a weighted average at least five points above passing for that year.

Curriculum

First Year (Required)

` · ·	Semester	r Hours
	Fall	Spring
Business Associations I (Duesenberg)		3
Chattel Transactions (Latty)	2	
Civil Procedure (Paschal & Pye)		3
Contracts (Gellhorn & Van Alstyne)		2
Criminal Law (Livengood & Shimm)	3	
Criminal Procedure (Everett & Pyc)		2
Legal Research & Writing (Strong)		1
Property I (Sparks & Strong)		2
Torts (Christie & Hardin)	2	3
Total	16	16

Second and Third Years

In the absence of special authorization by the Dean, each student is required to take in each semester courses aggregating not less than 12 and not more than 16 hours.

The program in the second and third years is entirely elective. In planning his elective program, the student must bear in mind that certain courses are pre-requisites to other advanced courses:

Business Associations II is pre-requisite to the Seminars in Securities Regulation and Corporate Planning and Drafting.

Business Associations II and Federal Taxation I are prerequisites to the Seminar in Corporate Insider Problems.

Conflict of Laws is a prerequisite to the Seminar in Conflict of Laws. Evidence is prerequisite to Trial Practice.

Federal Taxation I is a prerequisite to Federal Taxation II and Federal Taxation III.

Federal Taxation I, Federal Taxation II, and Property II are prerequisites to the Seminar in Tax and Estate Planning.

Jurisprudence is prerequisite to the Seminar in Jurisprudence.

Labor Relations is prerequisite to the Seminar in Labor Law. Trade Regulation is prerequisite to the Seminar in Antitrust.

Constitutional Law is prerequisite to the Seminar in Civil Liberties and Rights.

Fall Semester	Semester Hours
Administrative Law (Gellhorn)	

Seminar in Civil Liberties and Rights (Wallace)
Comparative Law (Baade)
Conflict of Laws (Pye)
Constitutional Law (Van Alstyne & Wallace)
Seminar in Corporate Insider Problems (Havighurst)
Seminar in Corporate Planning and Drafting (Duesenberg)
Seminar in Criminal Procedure (Everett)
Debtors' Estates (Shimm)
Evidence (Hardin & Strong)
Federal Courts (Paschal)
Federal Taxation I (Lowndes)
Endered Taxation II (Lownder)
Federal Taxation II (Lowndes) Seminar in International Organizations (Larson)
Seminar in International Organizations (Larson)
International Transactions (Baade)
Jurisprudence (Christie)
Labor Relations (Livengood)
Land Use and Development (Johnston)
Legal Accounting (Havighurst)
Legal History (not offered 1967-1968)
Seminar in Legislation (not offered 1967-1968)
North Carolina Practice (Bryson)
Property II (Sparks)
Seminar in Property Transactions (Everett & Johnston)
Sales and Secured Financing (Duesenberg)
Securities Regulation (Latty)
State and Local Government (Everett)
Trusts (not offered in 1967-1968)
Trusts (not offered in 1967-1968)
Spring Semester
Admiralty (Paschal)
Business Associations II (O'Neal)
Constitutional Law (Van Alstyne & Wallace)
Copyright and Unfair Competition (not offered 1967-1968)
Seminar in Criminal Law (Livengood)
Seminar in Criminal Law (Livengood)
Equitable Remedies (not offered 1967-1968)
Seminar in Estate Planning (Johnston)
Family Law (Baade)
Federal Taxation I (Lowndes)
Federal Taxation III (Lowndes)
Insurance (Duesenberg)
International Law (Baade)
Seminar in Jurisprudence (Christie)

Business Associations II (O'Neal) 2

Seminar in Labor Law (Livengood) 2
Legal Process (not offered 1967-1968)
Legal Profession (Wallace) 1
Seminar in Military Law (not offered 1967-1968) 2
Mortgages (Sparks) 2
Natural Resources Law (Johnston) 3
Negotiable Instruments (Shimm) 2
North Carolina Statutes (Bryson) 2
Patent Law (not offered 1967-1968)
Seminar in Poverty and Law (Pye & Shimm) 2
Seminar in Psychiatry and Law (Shimm) 2
Property III (Sparks) 3
Seminar in Regulated Industries (Gellhorn) 3
Social Legislation (Livengood) 2
State and Local Taxation (Van Alstyne) 2
Trade Regulation (Wallace) 3
Trial Practice (Hardin) 2
Seminar in Urban Renewal (Everett) 1
Workmen's Compensation (Larson) 2

Graduate Study in Law

The graduate program is framed with a view to the encouragement and recognition of legal scholarship. It is designed for the qualified candidate who aspires to a teaching career, or who wishes to become proficient in a special field of the law, to do legal research, to prepare himself for a public-law practice in or out of government, or to pursue studies in subjects he has not explored previously. This program is especially suitable for law teachers and for those who wish to become either law teachers or specialists in the law and who wish to carry on advanced study and original research under faculty supervision, and for foreign law students, teachers, and lawyers who desire to extend their knowledge of the laws of the United States and to engage in comparative legal research.

Three graduate degrees are granted: the degree of Master of Laws (LL.M.), the degree of Master of Comparative Law (M.C.L.), and the degree of Doctor of Juridical Science (S.J.D.).

Master of Laws Degree

The degree of Master of Laws is reserved for students who, having demonstrated their capacity for graduate work in law, maintain a level of scholarship substantially higher than that required for the degree of Bachelor of Laws.

Course Requirements

The candidate for this degree is required to complete a course of study comprising not less than twenty nor more than twenty-six semester hours, or approved research equivalent thereto. Two full semesters are required for the completion of this program. A candidate for this degree is reguired to include in his course of study at least two courses or seminars selected from those offered in Jurisprudence, in Legal History, and in the international or comparative law area. Other suitable courses will be selected by the candidate subject to the approval of the Committee on Graduate Study. In special circumstances, credit of not more than two hours a semester may be given for approved, supervised research projects. In addition to completing twenty semester hours of courses or seminars the candidate must prepare and submit an essay, representing substantial research on a legal subject. This essay is to be prepared under the supervision of the instructor in charge of the field in which the research is done. The candidate will find it helpful to have formulated a project of research, or alternative projects, before his admission to graduate study or, at any rate, before pursuing his graduate study in residence. In appropriate cases the candidate will be permitted, and may be encouraged, to take related work in other departments of the University.

Master of Comparative Law Degree

The degree of Master of Comparative Law is awarded only to students who maintain a level of scholarship substantially higher than that required for the degree of Bachelor of Laws.

Course Requirements

The candidate for this degree is required to complete a course of study comprising not less than twenty semester-hours. At least two semesters in residence are required for the completion of this program. A candidate for this degree is required to include in his course of study at least two courses from those offered in the world law and comparative law area, and either Jurisprudence or Legal History. Other suitable courses will be selected by the candidate subject to the approval of the Committee on Graduate Study. In special circumstances, credit of not more than two hours a semester may be given for approved, supervised research projects. The candidate is also required to submit an essay representing substantial research on a subject of comparative or international law, written in the English language. This essay is to be prepared under the supervision of the instructor in charge of the field in which the research is done. In appropriate cases the candidate will be permitted, and may be encouraged, to take related work in other departments of the University.

Doctor of Juridical Science Degree

Upon recommendation of the faculty, the degree of Doctor of Juridical Science will be conferred on students admitted to candidacy for that degree who complete and submit a monograph or series of essays suitable for publication and deemed by the faculty to be of distinguished character and who pass an oral examination before a special committee appointed for that examination.

Requirements

At least one academic year and, in the absence of an extension granted by the faculty, not more than three years must elapse between the award of the Master's degree and the award of the Doctorate of Juridical Science. Students who have received the Master's degree from another law school must spend at least two full semesters engaged in research at this School, and in addition may be required to complete a course of study prescribed by the Committee on Graduate Study. The monograph or series of essays required may be based upon, or be an extension of, the essay required for the Master's degree, provided substantial additional research is represented.

Resources for Study

The Law School Building

The new Law School building was completed and occupied in September of 1962. Located just off the Gothic core of the West (main) Campus, the building is of modified Georgian architecture with contemporary overtones. It reflects a notable characteristic of the School: a high ratio of facilities to students admitted. Despite long-range plans to keep the student body modest in size, the general spaciousness, number of classrooms and seminar rooms, library reading-room seating, library stack spaces, student carrels, student lockers, student lounge rooms, faculty offices, quarters for legal publications, special quarters for institutional studies, and courtroom are of proportions ordinarily associated with a far larger student body.

Additional information concerning the Law School and its facilities is contained in the illustrated brochure *Studying Law at Duke*.

The Law Library

The law library is one of the large law collections in the country. It consists of American and English statutory and case law; collections of international, comparative, and foreign law materials; treatises;

digests; encyclopedias; the various selected case series; a comprehensive collection of legal periodicals; and publications in the fields of history, economics, government, and other social sciences, supplemental to the strictly legal materials. The Library receives every current legal periodical of general interest printed in the English language and complete up-to-date legislation of the United States and of every state and territory of the Nation.

There are many thousands of additional volumes of a legal nature in the main University Library building, as well as the general collection of over a million volumes, to all of which the law students and faculty have convenient access.

The Law Library is administered by a professionally trained staff and is open to the public daily, as well as in the evenings when the Law School is in session.

Rule of Law Research Center

In the fall of 1958, the Duke Law School established its Rule of Law Research Center, with Professor Arthur Larson as its Director.

The purpose of the Center is to undertake both long-range and current studies and publications bearing on the settlement of international disputes and the achievement of peaceful change under law. Typical projects include two recently published books: Sovereignty within the Law and Propaganda: Toward Disarmament in the War of Words, and studies of Population Control Laws, and Compliance . . . and Enforcement under International Law. The Center also produces studies and publications in the field of the law of civil rights and race relations. A staff of international lawyers is maintained, with undergraduate law students as research assistants. The regular staff includes specialists in the world's major legal systems. Opportunities for course work at the Law School include not only the regular courses in International Law, Comparative Law, International Organizations, and International Transactions, but a unique Seminar in World Law for students particularly interested in this approach to the problem of world order.

Duke University students are also encouraged to combine graduate work with activities of the Center, opportunities for which are made available as for as practicable.

able as far as practicable.

Student Life

Living Accommodations

Housing

The Duke University Graduate Center provides accommodations available to men and women law students. In addition, women enrolled in the Law School may reside in the Graduate Women's Apartments, which are complete with basic furnishings, utilities, and maintenance. Of course, there are numerous private apartments and rooms proximate to the campus in the town or in the surrounding countryside.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Housing Bureau

for confirmation of the reservation.

The authorities of the University do not assume responsibility for persons selected as roommates. Each student is urged to select his roommate when the room is reserved. Any student who occupies a double room without a roommate will be given written notice from the Housing Bureau to obtain a roommate or he may be required to pay the rental consideration for the whole room.

Any exchange of rooms must be made at the Housing Bureau. Persons exchanging rooms without the approval of the Housing Bureau will be subject to the charges for both rooms.

Duke University Apartments, which consist of efficiency and one- and

two-bedroom apartments, are available to married law students. The apartments are complete with basic furnishings. Heat, electricity (except for window fans and air conditioners), hot and cold water, garbage collection, and maintenance of grounds are all included in the rental charge. For further information on married-student apartments, write to the Director of Housing, Duke Station, Durham, North Carolina.

Residence hall rooms and Duke University Apartments may be reserved by new applicants after they have been accepted officially for admission to the School of Law. Applications for residence hall rooms are to be made to the Director of Housing, Duke Station, Durham, North Carolina. For

fees and deposit details see pages 21-23.

Food Services

Food service is cafeteria style. The dining facilities on the West Campus include three cafeterias with multiple-choice menus, a grill, and the Oak Room with table service of full meals and *a la carte* items. In the Men's Graduate Center there is a cafeteria with multiple-choice menus and a Coffee Lounge where sodas and sandwiches are served from 11:30 a.m. to 11:00 p.m.

Services Available

Placement Service

Duke Law School's placement service is a very active one, in constant touch with leading law firms throughout the nation, federal and state agencies, corporate legal departments, and other employment opportunities. Special attention is given to placing second-year students in law internships during the following summer.

Each year the number of representatives coming to interview exceeds the number of students available to become associated with these poten-

tial employers.

Medical Care

With exceptions noted below, full medical and surgical care is furnished to all regularly matriculated law students of the University who have paid the semester tuition. This service is under the direction of the physician in charge with the cooperation of the staff of Duke Hospital. It includes hospitalization (limited to thirty days), medical and surgical care, drugs, dressings, x-ray studies, and ward (but not special) nursing. A charge for board is made at the same rate as in the University dining halls. Refraction of eyes and treatment of teeth and of all chronic and pre-existing

conditions, such as diseased tonsils, hernia, elective surgery, chronic skin conditions, and endocrine disturbances, or accidents or illnesses occurring during vacations or while off the campus are not included in this service. The cost of any necessary braces and orthopaedic appliances, as well as special nursing, must be borne by the patient. If the student has insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of his medical care.

The Duke Legal Internship Program

In the summer of 1965, the Law School with the aid of a grant from the National Defender Project, initiated a summer internship program in the administration of criminal justice. This program, which was organized and is directed by Professor Everett, brings the student interns into contact with a variety of problems in the criminal law, as they participate under the supervision of prosecuting attorneys and court-appointed defense counsel in the investigation and preparation of cases for trial.

Employment Opportunities

Although it is not advisable for a law student to undertake any substantial amount of outside work, particularly in the first year, arrangements have been made to provide part-time employment for capable law students who otherwise would be unable to meet the expense of studying law at Duke.

A number of positions as assistants in the Law Library and as research assistants are open to students, with some preference being given to those who do not receive other aid from the University.

Professional and Honorary Organizations

The Duke Bar Association

The Duke Bar Association coordinates the professional, social and other extra-curricular activities of the student body. The Association resembles, in its composition and purpose, both a university student government and a professional bar association. Among the various committee activities are publishing the Placement Bulletin, procuring special speakers, assisting in Moot Court competition, publicizing Law School activities, and sponsoring athletic and social programs.

The Duke Bar Association sponsors professional and social activities throughout the year. Dues are \$15.00 per annum, payable in September.

Order of the Coif

A chapter of the Order of the Coif, national legal scholarship society, has been established at Duke University School of Law. Its purpose is "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship." Election is restricted to the ten per cent of the graduating class who have attained the highest records in their law school work.

Moot Court Board

A program of student Moot Court arguments is conducted under the supervision of the Moot Court Board as a part of the course in Research and Writing in which all first year students are required to participate. In addition, there is an intramural program for upper-class students from which a team is selected each year to represent the Law School in the National Moot Court competition.

International Law Society

Recognizing the importance of the role of law in international affairs, the Duke International Law Society provides a program for examining the application of international law to world problems. Through a series of lecture-discussions in the fall called "A Short Course in International Law" and by featuring distinguished speakers in the field throughout the year, the Society provides its members the opportunity to make contact with the men and ideas that are shaping the development of international law.

Other activities include participation in the annual Philip C. Jessup International Law Moot Court competition, attendance at conferences sponsored by the Association of Student International Law Societies, and entry into various writing contests.

Membership is open to all law students at \$5.00 per annum.

Legal Research Program

The Legal Research Program is designed to provide students with the opportunity to prepare intensive legal memoranda on current problems submitted by practicing lawyers, judges or legislative committees. Supervised by an Editorial Board, the program provides students with meaningful experience in research, writing and editing, thus aiding in the development of practical legal skills.

Legal Fraternities

The two legal fraternities at Duke are Hughes Inn of Phi Delta Phi and Wiley Rutledge Chapter of Phi Alpha Delta. During the academic year,

these organizations sponsor luncheons and other meetings, which feature topics of professional interest, and a number of social activities.

Recreational Facilities

The University is located about two miles from the business district of Durham on wooded hills constituting part of the five-thousand-acre Duke Forest, which is maintained by the School of Forestry. Within a short distance from the campus are facilities for golf, horseback riding, and woodland hiking. Students of the Law School are entitled to the use of the University gymnasium, tennis courts, swimming pool, golf course, and similar privileges. Other opportunities for physical activity are available in the Intramural Program, as well as through such activity groups as the outing, sailing, and cycling clubs. Skiing has become increasingly popular. Several bowling alleys are available in and near Durham. Motion pictures are shown in Page Auditorium twice a week, and concert programs, recitals, lectures, and plays are presented frequently.

Publications

Law and Contemporary Problems

The School of Law publishes a quarterly, Law and Contemporary Problems, edited by Professor Clark C. Havighurst. This periodical, now in its thirty-second volume, presents in each issue a symposium on a problem of current importance, in which the inter-related social and economic, as well as legal, factors are discussed by writers of competence in these respective fields.

The circulation of Law and Contemporary Problems extends not only to members of the legal profession and law libraries throughout the country, but also to industrial and financial concerns, governmental agencies, and public and general university libraries. Individual issues are not infre-

quently used as materials for study in University courses.

Duke Law Journal

American legal education boasts at least one unique institution. Only in America, and only in law, are the scholarly professional journals edited and largely written by students. The Duke Law Journal carries forward this proud tradition, which dates from the latter part of the nineteenth century. Articles written by teachers, lawyers, judges, and other scholars are critically evaluated and edited by the board of student editors. Notes and comments concerning recent judicial, legislative, and other developments are written by the students themselves, and edited by their fellow students. Members of the faculty are of course available for advice and consultation. The six annual issues are widely circulated and become an integral part of the store-house of informal and critical materials to which the profession in all its branches must resort. The student-edited law journal has had a profound influence on the growth and development of the law.

Membership in the *Journal* is the highest honor that can be attained by the student, being reserved for those who not only excel in their courses but also demonstrate capacity to do creative research and writing. Moreover, in the well-nigh universal judgment of the profession, the experience gained in this work provides the best training that the Law School has to offer. It should be the aim of every qualified student to take advantage of this opportunity.

Corporate Practice Commentator

The Corporate Practice Commentator, a quarterly periodical devoted to significant developments and new thinking in the field of corporation law and practice, is edited by Dean F. Hodge O'Neal. Although the Commentator is published by a commercial concern, it is assembled and the manuscripts are prepared in the School of Law under the direction of Professor O'Neal. The Commentator gives attention to matters of interest and importance to counselors and managers of corporate and other business enterprises. Primary emphasis is placed on corporation law and practice in the narrow sense, but considerable attention is devoted to antitrust questions, labor matters, patents and copyrights, executives' compensation, fair trade legislation, and other matters arising from business activities.

Admission

Beginning students may enter only at the opening of the fall semester in any year. Students who have completed the first year of law study at this or any other law school approved by the Association of American Law Schools may enter at the beginning of any semester.

Procedures for All Applicants

Application must be made on the prescribed Law School application form which will be sent upon request. A fee of \$10.00 is charged for processing an application. No applicant will be accepted until all required documents are on file. These documents are: (1) the application itself, to which a recently made personal photograph must be attached; (2) a transcript of the college record; (3) a report of the applicant's score on the Law School Admission Test, described below; and (4) letters from an official of the college attended and from three or more responsible persons who are acquainted with the applicant's character and general qualifications. These letters will be requested by the Law School, and the applicant need only furnish the names and addresses of persons from whom the desired information can be obtained.

Most of our applicants apply at a time when they are still in college, either in the fall or winter of their current college year. We do not ordinarily wait for the completion of the current year's college work before admitting an applicant; normally we take acceptance action on the

basis of a transcript showing college work through the junior year, although we may at times ask for a transcript showing also one semester or term of the senior year. Such acceptance is tentative only and is subject to our final action taken in the light of the further supplemental transcript showing all the college work required for admission to the Law School. (However, it is very rare for an accepted applicant to be later rejected on the basis of his completed transcript.) A good time for a student in college to apply is in the fall of his final year.

The Law School Admission Test, referred to above, is administered by the Educational Testing Service. It is given four times a year at examination centers conveniently located throughout the United States. No special preparation for the test is suggested, since it is designed to measure aptitudes, abilities, and general background rather than knowledge of subject matter. The applicant's score on the test will be considered along with other data in passing upon his admission to the Law School. Application forms and information concerning the test should be procured by writing directly to the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

Requirements for Admission

An application for admission to Duke Law School as a candidate for the degree of Bachelor of Laws may be submitted by any person who is a graduate of a college of approved standing. Applications may also be submitted by a candidate who has completed in a college of approved standing work equivalent in number of units to three-fourths of that required for graduation and whose college work is of unusually excellent quality and in its entirety shows an average grade far above that required for graduation, the requirement in each case being determined by the regulations of the college where the work was taken.

Admission of Students in Combined Course Program

A number of colleges, upon application by their students, have permitted those who have completed three years of undergraduate work to enter the Duke Law School and upon the satisfactory completion of the first year of law school work to receive their Bachelor of Arts degree from such colleges. It is suggested that students desiring to enter Duke Law School under such a program make inquiry of their proper college authorities regarding this point if they meet the applicable requirements for admission. Not over three per cent of an entering class is admitted on this basis.

A student from an undergraduate college of Duke University who has

completed therein three years of study may apply to that college to enroll in a combined course wherein his first year of law study may be accepted toward the Bachelor of Arts degree. Upon the completion of four additional semesters of law study, he will receive the Bachelor of Laws degree.

Students considering entrance before obtaining the Bachelor's degree should consult the rules of the Board of Bar Examiners in the state where they plan to practice law, for regulations applicable to this program.

Admission to Advanced Standing

Any person who has complied with the requirements for admission set forth in this announcement prior to the commencement of his law study, who presents evidence of the satisfactory completion of at least one year of study at any law school which is a member of the Association of American Law Schools, and who is eligible for readmission to the law school from which he proposes to transfer, may be admitted to advanced standing, subject to such rules as would be applicable to students in this School having a comparable scholastic record. Provisional credit for courses so completed will be given, final credit being conditioned on the completion of at least one full year of law study in this School with an average at least five points above the passing grade. Adjustment of credit for work done in such other law schools may be made by the Dean or by vote of the faculty.

Admission of Candidates for Graduate Degrees

Applications for admission to graduate study should be addressed to the Dean of the Law School and should include transcripts of records of legal and prelegal work. For the requirements for the graduate degrees, see pages 6-8.

Master of Laws Degree

Any person who has received the first degree in law from a law school which is a member of the Association of American Law Schools, or from a university in the United Kingdom of Great Britain and Northern Ireland, or in Australia, Canada, Eire, or New Zealand, may be admitted as a candidate for the degree of Master of Laws, provided he satisfies the Committee on Graduate Study that his objective in desiring to do graduate work in law is consistent with the purposes for which the program is offered, and provided he demonstrates to the Committee, on the basis of his record, his capacity to take and profit by graduate work in law. Normally the applicant will be required to show a level of scholarship appreciably higher than that required for the first degree in law at the

institution from which he received that degree. Those applicants who aspire to a teaching career are expected to have had, and are expected to maintain throughout their graduate studies, an exceptionally high academic record.

Master of Comparative Law Degree

Any person (1) who has received the degree of doctor iuris or its equivalent from a foreign university, or (2) who, having completed such academic training as is required in his country for the practice of law, has already demonstrated his special qualifications by publications in learned journals or otherwise, and who has the knowledge of and facility in the English language needed to achieve distinction in competitive study at an American university may be admitted as a candidate for the degree of Master of Comparative Law (M.C.L.). The applicant must satisfy the Committee on Graduate Study that his objective in doing graduate work in comparative law is consistent with the purposes for which the program is offered, and he must further demonstrate to the Committee, on the basis of a scholastic record comparable to at least a B average at an American law school of high standing, and by his previous publications, if any, his capacity to profit by graduate work in law. Normally, admission to candidacy for this degree is limited to applicants who intend to study one or more specific fields of American law with a view to utilizing such knowledge upon their return to their respective countries, and who have already done some preparatory work in this direction.

Any person eligible to be admitted as a candidate for the degree of Master of Laws may, upon recommendation of the Committee on Graduate Study, be admitted to candidacy for the degree of Master of

Comparative Law.

Doctor of Juridical Science

A person holding the degree of Master of Laws or Master of Comparative Law (or Jurisprudence) from this or any other law school which is a member of the Association of American Law Schools may, on recommendation of the Committee on Graduate Study and favorable vote of the faculty, be admitted to candidacy for the degree of Doctor of Juridical Science (S.J.D.), provided he completed the work for the Master's degree with distinction.

Financial Information

Fees and Expenses

It is estimated that the expenses of a thrifty unmarried student at Duke Law School, aside from tuition, can be kept around \$1,400.00 per academic year.

Tuition

Tuition is due and payable not later than the day of registration for a particular semester. For the academic year 1967-68, the tuition is \$700.00 a semester. After the final day of registration no refund of the tuition will be made except for involuntary withdrawal to enter military service.

Registration Deposit

Admitted applicants are required to deposit the sum of \$50.00 with the Office of the Bursar. Except for involuntary withdrawal to enter military service, this deposit is nonrefundable but will be credited to the account of the matriculated student.

Living Accommodations

Housing. The Graduate Center is available to men and women enrolled in the Law School. The rooms are equipped for two persons and the rental charge for a double room is \$620.00 for the academic year or \$310.00 for each occupant (\$155.00 per semester for each occupant).

Also, women may reside in the Graduate Women's Apartments, which are complete with basic furnishings, utilities and maintenance. Three persons occupy each apartment. The rental charge for the academic year is \$450.00 for each occupant (\$225 per semester).

Duke University Apartments, which consist of efficiency and one- and two-bedroom apartments, are available to married law students. The apartments are complete with basic furnishings and the current rental charges per month are \$70.00 for the efficiency, \$90.00 for the one-bed-

room, and \$110.00 for the two-bedroom apartments.

Room Deposit. A \$25.00 deposit is required of each applicant before a residence hall room reservation is made. The initial room deposit is effective during the student's residence in the University residence halls if attendance is continuous in regular academic years.

Refund. The deposit will be refunded under the following conditions:

1. Within thirty days after the student has been graduated provided written notice is received at the Housing Bureau requesting refund.

2. Upon withdrawal from Duke University Residence Halls by students enrolled on the semester basis, provided written notice is received by the Director of Housing by August 1st for cancellation of a reservation for the fall semester, and not later than January 15th for cancellation of a reservation for the spring semester.

3. When the reasons requiring withdrawal are beyond the student's

control.

No refund will be made until the occupant has checked out of his room through the Housing Bureau and has settled his account with the Bursar.

Rooms are rented for the academic year but for no period of less than one semester without special arrangements. After the day of registration, no refund of room rent will be made except for involuntary withdrawal to enter the military service. Such refunds will be made in accordance with the University's established schedule. Regulations governing the occupancy of rooms will be supplied by the Director of Housing to those students who make application for housing.

Food Service. Food service is cafeteria style. The cost of meals runs approximately \$1.75 to \$2.50 per day, depending on the need and taste of the individual. The dining facilities on the West Campus include three cafeterias with multiple-choice menus, a grill, and the Oak Room with

table service of full meals and a la carte items.

In the Men's Graduate Center there is a cafeteria with multiple-choice menus and a Coffee Lounge where sodas and sandwiches are served from 11:30 a.m. to 11:00 p.m. The prices in these dining rooms are the same as on the West Campus.

Late Registration Fee

Students who register in any semester at a date later than that prescribed are required to pay to the Office of the Bursar a \$5.00 penalty for late registration.

Athletic Events Fee

Law students may secure admission to all regularly scheduled University athletic contests held on the University grounds during the entire academic year by payment of the athletic fee of \$15.00 per year plus any taxes that may be imposed. (This fee is payable in the fall semester.) They also may use the facilities of the Duke Golf Course upon payment of student green fees.

Motor Vehicle Registration Fee

Each motor vehicle operated on the campuses by students enrolled in the School of Law must be registered at the Traffic Office in the social science building, and a \$30.00 registration fee must be paid at this time by those who reside on campus.

Student Aid

Scholarships

Scholarships are available, varying in amount. Except for a few scholarships that are based purely on merit, scholarships are awarded only to needy applicants with markedly superior college records and comparable Law School Admission Test scores. A scholarship may cover all or part of the tuition charge. The more usual form of financial aid is a combination of scholarship and loan. Scholarship grants will be continued to secondand third-year students maintaining a high standard of work.

Loans

Prospective law students who will need loan funds to help finance their education should apply immediately following their acceptance for admission.

To the extent of the funds allocated to Duke University from its participation in the student loan program established under the National Defense-Education Act, loans up to \$2,000 per year (so limited as of the present writing) are available to Duke Students. Interest on these loans begins to accrue at three per cent nine months after the student leaves the School, and repayment normally begins ten months after the student leaves the School, with complete repayment scheduled over a period up to ten years.

Some states have now established guaranteed loan programs with similar terms for graduate and undergraduate study by their own residents. In keeping with policies of the University Student Loan Office, a student from such a state will be asked to apply first to the appropriate state agency. The Law School will supply information regarding any particular state and will make appropriate certifications in support of the loan application. If loan funds prove unavailable through the state guaranteed loan program, the student should apply directly to Duke University.

Loans from funds held in trust by the University are also available to qualified law students. Interest on these loans, which mature after the student has left the School, accrues from the date of each note at the rate of one per cent until the student has left the School and for five years thereafter at three per cent per year, with repayment in installments over the five-year period. Loans from these funds are available up to \$1,200 per year, less the amount of any loan made under the paragraph above.

Approval of loan application is based on the financial need, scholastic attainment, and personal integrity of the applicant. Unmarried students with automobiles, who plan to live on campus, must establish a bona fide need for the automobile before a loan application will be approved.

In addition to the loans above mentioned, the School participates in the American Bar Association Loan Fund and United Student Aid Fund programs. These programs provide guaranteed commercial bank loans to needy law students, up to \$1,500 per year.

A special fund is also available for law students for small loans to meet temporary financial emergencies arising during the course of the year.

Registration and Regulations

Registration

All students are required to register on the dates prescribed in the Law School Calendar, at which time class schedules and course cards must be completed and approved. A student's registration for any semester is not complete until he has settled all indebtedness with the Office of the Bursar. Students who register in any semester at a date later than that prescribed are required to pay to the Office of the Bursar a \$5.00 penalty for late registration.

Academic Regulations

Course Requirements

Minimum and Maximum Student Loads

No regular student is permitted to take less than twelve course hours per semester. No first-year student may take courses in excess of the first year program. Second- and third-year students are not permitted to take for credit more than sixteen course hours per semester, nor to audit and take for credit more than seventeen course hours per semester.

In exceptional cases, with the consent of the Dean a student may take more or less than the prescribed maximum or minimum loads, but no student shall receive full residence credit if he takes fewer than the ten hours per semester for credit required for approved schools by the American Bar Association.

Scholastic Standards

Eligibility to Continue Law Study. Any student who at the end of his first year or at the end of any subsequent semester has an average grade lower than D on all the work then taken is ineligible to continue his work in the School. Any other student (1) whose average final grade at the end of his first semester is below D, or (2) whose average grade at the end of any subsequent semester on all the work then taken is below C, or (3) who in any single semester or in any single year receives failure grades in courses totaling eight or more semester hours, may at any time be declared

by the Dean ineligible to continue.

Notification of Unsatisfactory Scholastic Standing. Every student subject to the provisions of the second sentence of the paragraph above, who has not been declared ineligible to continue his work in the School will be given a formal, written notice by the Dean's Office. This notice will set forth his average grade or grades and inform him (1) that he will be subject for the ensuing year to the special supervision of the Dean, who may order his dismissal from the School in the event of his failure to maintain a satisfactory scholastic standard, and (2) that he will be ineligible to receive a degree unless his work meets the scholastic requirements for graduation, which will be set forth in full in such notice.

Every other student whose average final grade at the end of any semester on the work of that semester, or on all work then taken, does not exceed the minimum average grade required for graduation by more than two points will be given a notice similar to that provided for above.

Attendance Regulation

Regular class attendance is required. The right to take the examinations, as well as the privilege of continuing one's study in the School of Law at any time, is conditioned upon regular attendance at the exercises of the School.

Nonacademic Regulations

Motor Vehicles

Each motor vehicle operated on the campuses by students enrolled in

the School of Law must be registered at the Traffic Office within 5 days after arrival, and thereafter must display the proper registration emblem. To register a vehicle, the student must pay the prescribed fee (see page 23) and present the following documents:

1. State vehicle registration.

2. State operator's license.

3. Evidence of automobile liability insurance as required by North Carolina law: \$5,000 per person and \$10,000 per accident for personal injuries, and \$5,000 for property damage.

Parking, traffic, and safety regulations will be given each student registering his vehicle. Students are expected to abide by these regulations.

Conduct of Students

All students are admitted subject to the rules of the University and of the Law School, and continuance in the School is conditioned upon the observance of such rules.

The University expects of its students loyal and hearty cooperation in developing and maintaining high standards of conduct and scholarship. The University therefore reserves the right, and matriculation is a concession by the student of this right, to compel the withdrawal of any student whose conduct at any time is not satisfactory to the University.

Registration for Bar Examination

Many states now require that a student, prior to or shortly after beginning the study of law, register with the board of bar examiners of the state if he intends to practice therein. Each student should ascertain by writing to the secretary of the board of bar examiners of the state in which he plans to practice, or by other channels of information, whether that state makes this requirement.

Courses of Instruction

Administrative Law. The formulation of statutory schemes of administrative regulations: the organization of administrative agencies; the determination, promulgation and enforcement of administrative programs; the respective spheres of administrative and judicial responsibility; judicial control over administrative action. Practice and procedure before administrative agencies: informal conferences and negotiations; formal hearings; constitutional limitations. 3 s.h. (fall). Gellhorn

Admiralty. The special body of law governing maritime affairs, especially the transportation of goods and passengers by water. Admiralty jurisdiction; marine insurance; carriage of goods; charter parties; general average; rights of injured seamen and others; collision; salvage; maritime liens and ship mortgages; limitation of liability; governmental activity in

shipping. 3 s.h. (spring). Paschal

Seminar in Antitrust. Selected studies and directed research and writing in current problems of federal antitrust law. (Not offered in 1967-68.)

Business Associations I. Legal principles concerning association in business by agency, partnership, other unincorporated forms and corporations. Creation, form and nature of agency, partnership and corporation, corporate existence (de facto corporations, corporate entity and its limitations), powers, duties, liabilities and compensation of agents, partners, officers and directors, risks in conduct of business by representatives (vicarious liability in tort, authority to contract), imputation of notice and knowledge, scope of enterprise (ultra vires), revocation and

termination of authority, ratification, undisclosed business associates, stability of the associational relationship. The purpose of this course is to grasp basic principles of Agency and Partnership and introductory related principles of corporation law. (The basic study of corporation law, however, is in Business Association II.) 3 s.h. (spring). Duesenberg

Business Associations II. Promoters, subscription to and issue of shares, stock structure and corporate capital, dividends, preferred stock, bonds, capital increases and reduction, corporate re-acquisition of own stock, elementary principles of corporate accounting, public issue of securities, stock transfers, fundamental corporate changes (recapitalization, sale, merger and consolidation, dissolution), stockholders' suits, and certain principles concerning management and operation not studied in Business Associations I. 2 s.h. each semester.

Chattel Transactions. This course uses the field of Personal Property and the traditional title-passing rules of Sales to appraise judicial reasoning and legal concepts. It serves both as a low-level course in judicial methodology and an introduction to commercial law. It deals with possession and title of chattels, the bailment relationship, artisan's lien, transfer of chattels by gift and miscellaneous inter-vivos transactions. It does not go into details of enforcement of buyers' and sellers' rights or sales financing. 2 s.h. (fall). Lat**t**y

Seminar in Civil Liberties and Civil Rights. Studies in the field of personal liberties (freedom of speech, press, religion, association, etc.) and in the field of civil rights (right to non-discriminatory treatment, right to fairness in procedure, etc.). The seminar will be concerned with issues about which the law is unsettled, and especially with issues raised in cases pending before the Supreme Court of the United States. 2 s.h. (fall).

Wallace

Civil Procedure. A study of the adjudication of civil cases with special emphasis on the Federal Rules of Civil Procedure. 3 s.h. (each semester). Paschal and Pye

Comparative Law. An examination and comparison of the law of selected jurisdictions on certain specific topics. The history, sources, and methods of the civil law will be investigated, discussed, and compared with those of common law countries. 3 s.h. (fall).

Conflict of Laws. A study of the special problems which arise when the significant facts of a case are connected with more than one jurisdiction. Recognition and effect of foreign judgments; choice of law; federal courts and conflict of laws; the United States Constitution and conflict of laws. 3 s.h. (fall). Pye

Constitutional Law. The distribution of and limitations upon governmental authority under the Constitution of the United States. Included are study of the doctrine of judicial review of legislative and executive action; the powers of Congress and the President; the limitations on State governmental powers resulting from the existence or exercise of Congressional power; and judicial protection against the exercise of governmental power in violation of rights, liberties, privileges, or immunities conferred by the Constitution. 3 s.h. (fall); 2 s.h. (spring). Van Alstyne and Wallace

Contracts. The formation and legal operation of contracts, their assignment, significance to third parties, and relationship to torts, restitution; and commercial law developments, the variety, scope, and limitations on remedies, and the policies, jurisprudence, and historical development of promissory liability. 3 s.h. (fall); 2 s.h. (spring). Gellhorn and Van

Alstyne

Copyright and Unfair Competition. Legal problems arising in the production, marketing, and distribution of literary, artistic, musical, and related achievements. While the course will be concerned primarily with statutory and common law copyright, it will include study of the law of unfair competition, including legal protection of trade marks and trade names, and some comparison of copyright with the law of patents and

design patents. (Not offered 1967-68.)

Seminar in Corporate Insider Problems. A study in depth of the legal problems of corporate officers and directors, substantial shareholders, and others who may be classed as "insiders." Subject matter will include tax and corporation law aspects of executive compensation and fringe benefits, special problems under Rule 10b-5 and the insider-trading provisions of the Securities Exchange Act of 1934, the strictures surrounding secondary distributions under the Securities Act of 1933, indemnification of officers and directors, the protection of trade secrets, and the enforceability of particular contract covenants. Special emphasis will be placed on practical problems of advising both publicly- and closely-held corporate clients, estate-planning considerations, and the preparation of documents, particularly executive employment contracts. 2 s.h. (fall). Havighurst

Seminar in Corporate Planning and Drafting. The student is given hypothetical corporate problems (perhaps taken from the practicing lawyer's desk) on a client's proposed course of action; each problem is designed to require the student to grasp the business situation and goals involved, analyze for pertinent legal principles, plan the transaction to avoid legal business (including taxation) pitfalls, plan the requisite steps to consummate the desired transaction, draft the appropriate papers and

present his research. 2 s.h. (fall). Duesenberg

Criminal Law. An introductory study of the law of crimes and the administration of criminal justice; analysis of the criminal act and the mental element in crime; consideration of specific offenses as defined by statute and the common law; discussion of typical defenses in relation to specific crimes. 3 s.h. (fall). Livengood and Shimm

Seminar in Criminal Law. Current problems in administering criminal justice, including studies of theory and technique in criminal procedure

(investigation, prosecution and defense of criminal charges), inquiry into basic policy in the use of criminal sanctions for the promotion of public order, consideration of contemporary developments (legislative, judicial and administrative) in substantive and adjective criminal law, and analysis of specific problem areas such as mental responsibility, sexual deviation, attempts, and vicarious liability. 2 s.h. (spring). Livengood

Criminal Procedure. A study of the elements of Anglo-American criminal procedure in the administration of justice. 2 s.h. (spring).

Everett and Pye

Seminar in Criminal Procedure. Investigation of crime and the police practices pertinent thereto, including detention and arrest, interrogation, search and seizure; exclusionary rules of evidence; motions for continuance, change of venue, and challenges to the jury; problems of the indigent defendant; discovery problems in criminal trials; post-trial appellate procedures. 2 s.h. (fall). Everett

Debtors' Estates. Comparative study of methods used for the liquidation of debtors' estates. The nonbankruptcy materials cover individual creditor's rights by attachment, garnishment, execution, creditors' bills and the like; common law compositions and extensions; and general assignments. The bankruptcy materials cover, in the main, the first seven

chapters of the Bankruptcy Act. 3 s.h. (fall).

Equitable Remedies. A survey of equitable remedies in general (including enforcement of equity decrees) and of important parts of the fields of equity and restitution that are not covered in other courses. (Not offered in 1967-68.)

Seminar in Estate Planning. Seminar devoted to problems and techniques of tax and estate planning. Enrollment limited. 2 s.h. (spring).

Evidence. A study of the common-law rules of evidence, including the requirements of relevancy and materiality; competency and privilege of witnesses, examination and cross-examination, burden of proof and presumptions, judicial notice, and functions of judge and jury. 3 s.h. Hardin and Strong

Family Law. Marriage; annulment; divorce; separation; property rights.

2 s.h. (spring). Baade

Federal Courts. A study of the federal courts with respect to the part played by them in achieving a workable federalism. Special attention will be given to the original jurisdiction of the federal district courts, the relationship of the federal courts to state courts and state law, and the permissible and desirable range of federal judicial power. 3 s.h. (fall). Paschal

Federal Taxation I. An introduction to federal taxation for those interested in that subject and a terminal course for those who are not but seek the minimum knowledge necessary to identify a tax problem. A detailed study of the basic concepts of the income tax is followed by a survey of some specialized tax areas, such as the income tax treatment of estates and trusts, partnerships, corporations, corporate distributions and adjustments and the federal estate and gift taxes. 3 s.h. (each semester). Lowndes

Federal Taxation II. The principal emphasis of the course is on the federal estate and gift taxes. Consideration is also given, however, to the related portions of the federal income tax dealing with the taxation of the income of estates and trusts and income in respect of a decedent. 3 s.h. (fall). Lowndes

Federal Taxation III. The course is concerned principally with the taxation of corporations and corporate distributions and adjustments under the federal income tax. Among the topics considered are how corporations are taxed, the organization of a corporation, the tax treatment of corporate distributions, redemptions and liquidations, collapsible corporations, the accumulated earnings and personal holding company taxes, subchapter S corporations, and corporate reorganizations and divisions, along with a comparative study of the taxation of partners and partnerships. 3 s.h. (spring). Lowndes

Insurance. The nature of "insurance"; government supervision and control; types of insurance organization; the legal requirement of insurable interest; interests of others than the named insured; the measure of indemnity; subrogation; the beneficiary's interest in life insurance; the insured event and excepted causes; warranties, representations and concealment; the making of insurance contracts; waiver, estoppel and elec-

tion. 2 s.h. (spring). Duesenberg

International Law. A survey of public international law of peace, as evidenced especially in decisions of national and of international courts; the drafting and interpretation of treaties; the nature of handling of international claims; the organization and jurisdiction of international tribunals, with special reference to the International Court of Justice; developments with respect to the codification of the law. 3 s.h. (spring). Baade

Seminar in International Organizations. This course covers the principal legal questions, including current controversies, affecting the United Nations or growing out of the United Nations Charter. 2 s.h. (fall). Larson

International Transactions. Legal framework of U. S. foreign trade and investment; foreign trade and investment laws of selected foreign countries; function of international economic law; international economic agreements; problems of foreign trade and investments. 3 s.h. (fall). Baade

Jurisprudence. Discussion of some of the basic problems of classical and contemporary juristic theory, with applications to cases and statutes. 3 s.h. (fall). *Christie*

Seminar in Jurisprudence. An intensive inquiry into specific problems of modern jurisprudential theory. 2 s.h. (spring). Christie

Seminar in Labor Law. An intensive examination of significant problems in collective bargaining, union-management relations and labor dispute settlement, with emphasis upon the drafting and interpretation of contract clauses, theories and techniques in contract negotiation, grievance handling, voluntary arbitration and other procedures for the adjustment of disputes, and the inter-relation of the legal and economic aspects of labor problems. 2 s.h. (spring). Livengood

Labor Relations. A study of the law relating to collective bargaining and concerted labor activities, including the National Labor Relations Act and related legislation, the legal aspects of strikes, boycotts and picketing, the negotiation and administration of collective bargaining agreements, procedures for the settlement of labor disputes, and relations between the

union and individual employees. 3 s.h. (fall). Livengood

Land Use and Development. A survey of legislative, administrative, and judicial controls utilized to facilitate the orderly development and redevelopment of real property. This consideration will include public and private nuisance, zoning, subdivision control, housing codes, street mapping, and condemnation. The clash of individual and societal interests in land use is explored through cases involving the distinction between valid police power regulations and "takings" for public use which require payment of compensation. Problems of urban renewal, regional planning, and pollution of water and air will also receive consideration. 3 s.h. (fall). *Iohnston*

Law Journal. One semester-hour of credit shall be accorded for each semester of satisfactory Duke Law Journal activity as a competitor or as a member of the Editorial Board other than an officer; two semester-hours of credit shall be accorded for each semester of satisfactory Law Journal

activity as an officer of the Editorial Board.

Legal Accounting. An examination and analysis of accounting principles and practices necessary for reasonably effective collaboration with accountants on problems requiring the work of both lawyers and accountants. The course is designed to develop in the student an understanding of how an accountant's work is used by top management in making decisions, by government in making and enforcing regulations, and by investors and lenders in exercising a discriminating choice in the employment of their funds. 2 s.h. (fall). Havighurst

Legal History. A study of the development of fundamental English and American legal institutions, with primary emphasis upon the establishment and growth of American law from the colonial period to the present. (Not

offered in 1967-68.)

The Legal Process. A study of problems in the making and application of law and of the institutions for solving those problems. This has been called a course in "working jurisprudence." It deals with major jurisprudential concepts, not in the abstract but in an attempt to put them to work in the solution of specific legal problems. The problems cut across

conventional course lines and include not only those confronted by courts, but also those confronted by private persons and their counsel, legislatures, administrative agencies, public officials, and others. (Not offered in 1967-68.)

Legal Profession. Lectures, discussions, and reading concerning the ethical problems and professional responsibilities of the lawyer. 1 s.h.

(spring). Wallace

Seminar in Legislation. Studies in the legislative process and in the drafting and interpretation of statutes. Included will be exercises in legislative drafting in addition to study of selected materials on such subjects as lobbying, legislative procedures, legislative investigations, legislative-administrative relations, and statutory interpretation. (Not offered in 1967-1968.)

Seminar in Military Law. A study of military jurisdiction, the rights of military personnel, the body of both substantive and procedural law that has developed under the Uniform Code of Military Justice; in addition to its other goals, the seminar will seek to develop skills in statutory interpretation and to encourage comparisons between civilian and military

criminal law administration. (Not offered in 1967-1968.)

Mortgages. A study of the land mortgage as a security interest in real property, including the history of its development, appointment of receivers of rents and profits, accounting between mortgager and mortgage, redemption and foreclosure, mortgage priorities and equitable mortgages. 2 s.h. (spring). Sparks

Natural Resources Law. A survey of legal principles affecting the utilization of timber, minerals and water. Acquisition of rights will be considered, as well as resource development regulation and conservation

techniques. 3 s.h. (spring). Johnston

Negotiable Instruments. Study of the rules of the law merchant and the provisions of the Negotiable Instruments Law and the Uniform Commercial Code relating to the functions and legal incidents of checks, bills of exchange, promissory notes, and similar commercial instruments. 2 s.h. (spring). Shimm

North Carolina Practice. A study of the steps in a civil action at law from the issuance of process to the entry of final judgment including service of process; appearance and waiver of process; selecting the jury; various motions made during the trial; submission of case to jury; verdict; judgment; noting and perfecting appeal. Also included are such topics as jurisdiction of various courts in North Carolina; venue; trials without a jury; provisional remedies and special proceedings. 2 s.h. (fall). Bryson

North Carolina Statutes and Decisions. A study of selected statutes of North Carolina with discussion of their application, and an analysis of the decisions of the Supreme Court of North Carolina construing them.

2 s.h. (spring). Bryson

Patent Law. A short survey of the law relating to patents and trademarks, with some coverage of copyrights, primarily to give the general practitioner a foundation in these areas to collaborate effectively with specialists. Special attention is given to overlapping problems in abovementioned areas. (Not offered in 1967-68.)

Seminar in Poverty and Law. An examination of legal problems and programs of particular importance to the poor. Criminal justice, family law, consumer credit, and relations of landlord-tenant and creditor-debtor will be investigated from this standpoint. 2 s.h. (spring). Pye

and Shimm

Property I. The basic concepts of real property law and conveyancing. Historical background; estates in land, including the fee simple, the fee tail with its statutory substitutes, the life estate, the estate for years and other non-freeholds; concurrent ownership; types of future interests; conveyances before and after the Statutes of Uses; landlord and tenant; the modern deed—kinds, delivery, description, title covenants; covenants and agreements running with the land at law and in equity; easements; recording and title registration. 2 s.h. each semester. Sparks and Strong

Property II and Property III. The various rules and concepts governing transmission of property from one generation to another, including the materials normally covered in the traditional courses on Wills, Trusts and Future Interests. Historical background; intestate succession at common law and under modern statutes; limitations upon testamentary power; execution and revocation of wills; contest of wills; lapse, ademption and satisfaction; the nature, creation, elements, enforcement and administration of trusts; future interests, comprising reversions, remainders, executory interests, rights of entry, possibilities of reverter, and their incidents; class gifts; powers of appointment; rule against perpetuities and other restrictions on the creation of interests; construction of wills, trusts and deeds. Property II (fall) and Property III (spring). [Students may take one or both semesters.] 3 s.h. (each semester). Sparks

Seminar in Property Transactions. Supervised drafting of documents required for complex property transactions and development, such as cooperatives, condominia and shopping centers. A limited number of students will work in teams. 2 s.h. (fall). Everett and Johnston

Seminar in Psychiatry and Law. An inquiry into the relationship between the science of psychiatry and various legal concepts, with consideration of the desirability of changes in the law. Particular attention will be given to the subject of criminal responsibility. 2 s.h. (spring). Shimm

Seminar in Regulated Industries. Selected studies of government economic regulation in such regulated industries as transportation, broadcasting, and power, plus directed research and writing in specific problems of trade regulation. 3 s.h. (spring). Gellhorn

Research and Writing. Classroom instruction and individual problems

in the use of law books, the preparation of memoranda of law, and moot

court briefing and argument. 1 s.h. (each semester). Strong

Sales and Secured Financing, Study of the rules of the common law and the provisions of the various uniform acts and the Uniform Commercial Code relating to warranties, risks, remedies for breach, financing, and other legal problems arising in the sale of goods. 3 s.h. (fall). Duesenberg

Securities Regulation. A study of the federal and state securities laws and the industry they govern, with emphasis on the mechanics and regulation of the distribution process and trading in securities; subjects dealt with include the functions of the Securities and Exchange Commission, registration and disclosure requirements and related civil liabilities, "blue sky" laws, proxy solicitation and reporting requirements, broker-dealer regulation, the self-regulatory functions of the exchanges and the regula-

tion of investment companies. 3 s.h. (fall). Latty

Social Legislation. Contemporary public welfare law, with emphasis on government regulation of conditions of employment, including the Fair Labor Standards Act and other wage-hour and child-labor statutes, unemployment insurance and other social security legislation, employers' liability and workmen's compensation acts, and related laws establishing minimum standards for the creation, continuance and termination of the employment relationship. In addition to other objectives, the course will seek to develop skills in legislative advocacy and procedure, and in the drafting and interpretation of statutes. 2 s.h. (spring). Livengood

State and Local Government. State legislative creation and control of local governmental units, municipal police power, limitations on taxation, indebtedness, and expenditures of funds, bond issues, tort liability, annexation, eminent domain, subdivision regulation, public housing, and

urban renewal. 2 s.h. (fall). Everett

State and Local Taxation. Constitutional limitations on the taxing power; jurisdiction to tax; state excise taxes; and the general property tax.

2 s.h. (spring). Van Alstyne

Torts. The bases of liability in damages for personal injuries and injuries to property; bases other than fault; negligence; intentional infliction of harm. Procedure in jury trials; proof of negligence; causation and "proximate cause"; defenses. Special rules applicable to occupiers and owners of land, motor vehicle accidents, suppliers of goods and remote contractors. Misrepresentation and fraud; defamation; assault and battery; false imprisonment. 2 s.h. (fall); 3 s.h. (spring). Hardin

Trade Regulation. A study of the federal antitrust laws and their common law background, with emphasis on the economic policies involved. and of specific unfair trade practices and unlawful restraints at common law and under state and federal statutes. Attention is given to a critical examination of legislation designed to enforce competition as the primary

control of the economic system; legal measures that supplement or replace competition; the relation of patents and antitrust; price discrimination; fair trade laws; regulation of advertising; trademarks and trade-names; appropriation of trade values; bovcotts; and disparagement. 3 s.h. (spring). Wallace

Trial Practice. A study of the function of the advocate in the trial of law suits, with emphasis upon methods of pre-trial preparation and development of facts in court, typical uses of rules of procedural and substantive law in trial proceedings, and tactical and ethical aspects of problems which confront the trial lawyer. The course is open to third-year students who have completed the course in Evidence. 2 s.h. (spring). Hardin

Trusts. The nature, creation and elements of a trust; character and transfer of the beneficiary's interests; charitable trusts; administration of trusts; termination and modification of trusts; liabilities to and of third persons; enforcement of trusts; and constructive and resulting trusts. (Not offered in 1967-68.)

Seminar in Urban Renewal. A study of the urban renewal program, as implemented at the federal and local levels. Extensive field work is planned and urban renewal officials will meet with members of the seminar to discuss problems of implementing an urban renewal program. Everett 1 s.h. (spring).

Workmen's Compensation. The main elements of Workmen's Compensation Law of the United States are covered through the assignment of typical office problems on which legal memoranda or opinions are pre-

pared. 2 s.h. (spring).

Seminar in World Law. The emphasis of this course is on those aspects of national law and international law which have an important influence on weakening or strengthening a world legal order. The course does not duplicate the material in the regular course on International Law. (Not offered 1967-68.)

Enrollment 1966-1967

First Year

Aiken, Conrad J. (Wittenberg University), Englewood, Ohio Alexander, James P. (Duke University), Marietta, Georgia Anderson, John K. (Clemson University), Allendale, South Carolina Andrews, William M. (University of California), Santa Rosa, California Bair, William J. (Catawba College), Reading, Pennsylvania Bates, William J., Jr. (Wofford College), Moncks Corner, South Carolina Beatty, Joseph R. (University of North Carolina), Charlotte, North Carolina Becton, Charles Leo (Howard University), Ayden, North Carolina Bennett, Robert E., Jr. (University of North Carolina), Pittsburgh, Pennsylvania Boone, John S., Jr. (The Citadel), Gibsonville, North Carolina Boyd, Tommy H. (Florida State University), North Miami, Florida Braun, Michael A. (Colgate University), Charleston, West Virginia Briggs, William H., Jr. (Davidson College), Winston Salem, North Carolina Brooks, Clifford D. (Augustana College), Rapid City, Illinois Campbell, Alvis E. (Guilford College), High Point, North Carolina Canning, John A., Jr. (Denison University), Bayport, New York Chaffin, Ethel T. (University of Georgia), Athens, Georgia Clayton, Joseph M., Jr. (Drew University), Shrewsbury, New Jersey Coole, William R. (Western Michigan University), Wayne, Michigan Cooney, John P., Jr. (Indiana University), Western Springs, Illinois Costello, George A. (Johns Hopkins University), Chapel Hill, North Carolina Davenport, James P. (Duke University), Garner, North Carolina DeVeau, Ronald E. (Lehigh University), Athens, Ohio Donoghue, Norman E., II (Williams College), West Chester, Pennsylvania Dunlap, James W. (Stanford University), San Francisco, California Dunnack, L. Smith, Jr. (Colby College), Augusta, Maine Ettinger, William A. (Lafayette College), Bronx, New York Evans, Thomas S. (Duke University), South Salem, New York Firestone, Charles M. (Amherst College), University City, Missouri Foscue, David E. (Wooster College), Grosse Ile, Michigan Frederickson, Jerry G. (Brigham Young University), Idaho Falls, Idaho Gibbs, Charles H., Jr. (Williams College), Charleston, South Carolina Godwin, Howard G., Jr. (University of North Carolina), Dunn, North Carolina Gold, Alan S. (University of Florida), Gainesville, Florida Goldsberry, Leslie A. (Ohio University), Athens, Ohio Haddock, Gerald R. (Brigham Young University), Burbank, California

Harker, John R. (Brigham Young University), Shelley, Idaho Harmon, John M. (University of North Carolina), Statesville, North Carolina Haslam, Charles Linn (Princeton University), St. Petersburg, Florida Herendeen, Robert P. (Boston College), Newton, Massachusetts Hilstad, Paul A. (Harvard University), Mayville, North Dakota Hoos, John O. (Colgate University), Livingston Manor, New York Horning, Richard A. (University of California), Orinda, California Huff, Reece R. (Brigham Young University), Whittier, California Jenkins, Jerry R. (Southeast Missouri State College), Cape Girardeau, Missouri Johnson, M. Scott (Birmingham-Southern College), Gadsden, Alabama Junker, Richard N. (Davidson College), Charlotte, North Carolina Kanar, Stephen P. (University of Florida), Eustis, Florida Kane, Michael J. (Dartmouth College), Philadelphia, Pennsylvania Keller, Christine (Rice University), Essex Falls, New Jersey Kelly, David L. (Purdue University), Lafayette, Indiana Klaber, David G. (Yale University), Pittsburgh, Pennsylvania LaPorte, Richard G. (University of Notre Dame), Cleveland 11, Ohio Lasker, Joel M. (Knox College), Merrick, New York Laufer, David D. (Brown University), Buffalo, New York Leisure, Ronald J. (Wabash College), Marion, Indiana Lewis, Jeffrey E. (Duke University), Delaware, Ohio Leydon, Edward R. (Bowdoin College), Bucks County, Pennsylvania Lilienthal, Bruce W. (University of Florida), St. Petersburg, Florida Luttrell, Robert S. (Washington and Jefferson College), Broomall, Pennsylvania McNamara, Walter J., III (Western Reserve University), North Madison, Ohio Mathews, Louise A. (Duke University), Wallingford, Pennsylvania Maynes, Robert A. (Yale University), Fairfield, Connecticut Merry, Kathleen (Trinity College), Pittsburgh, Pennsylvania Mill, Charles S., Jr. (Lafayette College), Scarsdale, New York Mock, Frank MacKenzie (Duke University), Los Angeles, California Moore, James R. (Whitman College), Longview, Washington Moxley, John D., Jr. (Duke University), Clearwater, Florida Mullen, Graham C. (Duke University), Gastonia, North Carolina Murphy, Leonard M., Jr. (Georgetown University), Rockville, Maryland Murray, Katherine (Duke University), Schenectady, New York Murray, Thomas W. (Hamilton College), Massena, New York Myers, Donald B., Jr. (DePauw University), Hamilton, Ohio Neill, Ronald H. (Wooster College), Akron, Ohio Newton, Alexander D. (Brown University), Madison, Georgia Niles, N. Lawrence (Williams College), Saxtons River, Vermont Nishiyama, Daniel (Hamilton College), Altadena, California Noback, Roger A. (Harvard University), Brookfield, Wisconsin O'Brien, Michael F. (DePauw University), Park Ridge, Illinois Page, Robert F. (Duke University), Rocky Mount, North Carolina Palmer, James D. (University of Maryland), Mexico, New York Perry, Wilson David (Alfred University), Corning, New York Platt, John B. (Colgate University), Haddon Heights, New Jersey Powell, David (Davidson College), Little Rock, Arkansas Pringle, Robert B. (University of North Carolina), Haddonfield, New Jersey Pursley, William E., Jr. (Duke University), Charlotte, North Carolina Ramerman, Dale B. (Seattle-Pacific College), Seattle, Washington Randall, Robert G. (Yale University), Sidney, New York Rind, Michael D. (University of Chicago), Syosset, New York

Roberts, Eugene V., Jr. (University of Oklahoma), Kiowa, Oklahoma Russ, Michael C. (Duke University), Atlanta, Georgia Saleeby, Dudley, Jr. (The Citadel), Dillon, South Carolina Sapp, John R. (University of Kansas), Havana, Illinois Schaperkotter, James E. (University of Missouri), Columbia, Missouri Schwartzman, Denise Davis (Temple University), Philadelphia, Pennsylvania Seeley, James John (Rutgers University), Cherry Hill, New Jersey Sherwood, Toby L. (Pembroke College), Rye, New York Shumway, Ronald L. (Brigham Young University), Phoenix, Arizona Singer, Allan W. (Dartmouth College), Cambridge, Massachusetts Smith, Young M., Jr. (University of North Carolina), Hickory, North Carolina Spence, Lee H. (Brown University), Ridgewood, New Jersey Stark, R. Keith (University of Notre Dame), Birmingham, Michigan Streepey, Jefferson K. (DePauw University), New Albany, Indiana Tice, Michael C. (Princeton University), Tice, Florida Vacendak, Stephen T., Jr. (Duke University), Scranton, Pennsylvania Vason, Wayne R. (University of Georgia), Madison, Georgia Votruba, David C. (Kalamazoo College), Traverse City, Michigan Waldrep, Joseph L. (Clemson University), Lanett, Alabama Wallis, Farnklin F. (Central Methodist College), Belleview, Missouri Warwick, Robert S. (Princeton University), Vero Beach, Florida Webb, Charles, III (University of Virginia), Ardmore, Pennsylvania White, Peter Allen (Kenyon College), Cleveland, Ohio Willcox, Breekinridge L. (Yale University), Chevy Chase, Maryland Worth, Thomas C., Jr. (University of North Carolina), Raleigh, North Carolina Wyrick, Samuel T., III (Harvard University), Greensboro, North Carolina

Second Year

Abbott, Charles M. (University of Wyoming), Scottsbluff, Nebraska Alexander, Bruce D. (Yale University), West Hartford, Connecticut Angelini, Michael P. (Wesleyan University), Leominster, Massachusetts Assini, Frederick W. (Holy Cross), Koppel, Pennsylvania Attkisson, Jerry B. (Wake Forest College), Kinston, North Carolina Bianchi, Carl F. (Hamilton College), Rochester, New York Bibeau, Brian H. (Florida State University), Clearwater, Florida Boroughs, Paul T. (University of South Carolina), Dillon, South Carolina Bouknight, Jacob A. (Wofford College), Lamar, South Carolina Breitweiser, William S. (Princeton University), Durham, North Carolina Britton, Christopher Q. (University of Iowa), Lehigh, Iowa Brooks, Donald B. (Duke University), Moorestown, New Jersey Brown, Garrett E. Jr. (Lafayette College), Upper Montclair, New Jersey Brownell, John R. (Catawba College), Westfield, New Jersey Bruee, Laurie B. (Tufts University), Beverly, Massachusetts Burton, Charles B. (Stanford), Phoenix, Arizona Carstetter, David W. (Pennsylvania State University), Reedsville, Pennsylvania Castle, Truman R. (Duke University), Glenview, Illinois Charleston, Joel S. (University of Toledo), Oceanside, New York Clarke, Thomas J. (University of Iowa), Des Moines, Iowa Davenport, Gary L. (Duke University), Paris, France Dawson, Grayce (Duke University), Durham, North Carolina Diekerman, Stephen G. (Union College), Maplewood, New Jersey Dunek, Thomas H. Jr. (Wabash College), Belleville, Illinois Eason, William E. Jr. (Duke University), Four Oaks, North Carolina

Ferguson, Henry L. (Williams College), Fishers Island, New York Ford, Paul B. Jr. (Boston College), Hamden, Connecticut Foss, Stuart M. (New York University), Wilbraham, Massachusetts Fox, Robert C. (University of Minnesota), Hopkins, Minnesota Frey, Robert I. (Colorado State University), Evanston, Illinois Garro, Robert K. (Monmouth College), Skokie, Illinois Gates, Gilbert L. (Duke University), High Point, North Carolina Goff, Ernest L. (Dartmouth College), Rehoboth, Massachusetts Greener, Ralph B. (Wheaton College), Peoria, Illinois Hamilton, Geoffrey (Wooster), Hastings-on-Hudson, New York Hancock, William G. Jr. (University of North Carolina), Charlotte, North Carolina Hardin, J. Michael (University of Pennsylvania), Louisville, Kentucky Harkness, Andrew M. (Colgate University), Canandaigua, New York Harlow, David A. (Lehigh University), West Orange, New Jersey Hatcher, James L. Jr. (Howard University), Washington, D.C. Hieronymus, Edward W. (Knox College), Colorado Springs, Colorado Hopkinson, Virginia M. (Loyola University), Oak Park, Illinois Hughes, Randall L. (University of Florida), Auburndale, Florida Hutchison, Stuart N. III (Lafayette College), Pittsburgh, Pennsylvania Ingraham, Charles O. (Colgate University), Endwell, New York Jeffers, Fulton P. (University of Maryland), Salisbury, Maryland Johnson, Carl E. Jr. (Oberlin College), Morgantown, West Virginia Jonas, Richard E. (University of North Carolina), Lincolnton, North Carolina Jones, Richard V. (Yale University), Hasbrouck Heights, New Jersey Karmazyn, Basil W. (University of Connecticut), Wapping, Connecticut Kearns, Peter F. (Brown University), Manchester, New Hampshire Keenan, James E. (Carleton College), Lake Forest, Illinois Kelly, James H. (Davidson College), Conover, North Carolina Kendig, James J. (University of the South), Fairborn, Ohio Kimbrough, Lawrence M. (Davidson College), Davidson, North Carolina Kirby, John D. (Carleton College), Urbana, Illinois Kissam, Roger H. (Duke University), Rumson, New Jersey Kittrell, Rosemary (Agnes Scott College), Columbia, South Carolina Lambeth, Walter O. Jr. (Duke University), Edenton, North Carolina Ledbetter, Clarence L. (Hampton Institute), Dunn, North Carolina Leermakers, Stephen W. (Wesleyan University), Rochester, New York Lyon, Carl F. Jr. (Duke University), Sumter, South Carolina McGowan, James P. (Notre Dame University), Elyria, Ohio McKee, Thomas J. (Princeton University), Blauvelt, New York Malinzak, Edward (Western Reserve University), Vestaburg, Pennsylvania Marquis, Robert S. (Davidson College), Knoxville, Tennessee Mast, Kent E. (Princeton University), Lima, Pennsylvania Maxwell, Robert W. II (Hamden-Sydney), Waynesburg, Pennsylvania Meadors, Marilyn E. (Duke University), Cincinnati, Ohio Messinger, Donald H. Jr. (Colgate University), Clyde, New York Miller, Martin J. (Colgate University), St. Petersburg, Florida Moeling, Walter G. IV (Duke University), Alexander City, Alabama Moore, Fred H. (Duke University), Lookout Mountain, Tennessee Murphy, Thomas H. (Colorado State University), Denver, Colorado Palmer, Stephen H. (University of Pennsylvania), Wayne, Pennsylvania Patton, William L. (Yale University), Hamden, Connecticut Pepe, Stephen P. (Montclair State College), Montclair, New Jersey Piatt, William M. IV (Principia College), Durham, North Carolina Pierson, Stuart F. (Hobart College), Washington, D.C.

Pinna, William P. (De Paul University), Chicago, Illinois

Prewitt, David E. (Dartmouth College), Wayne, Pennsylvania Rather, Gordon S. Jr. (Vanderbilt University), Little Rock, Arkansas Reilly, Edward A. (Princeton University), Brooklyn, New York Rohwedder, James L. (University of Iowa), Memphis, Tennessee Rollins, Overman R. (Duke University), Morganton, North Carolina Romp, Thomas L. (Duke University), Vermilion, Ohio Rose, Charles P., Jr. (Duke University), Henderson, North Carolina Safley, James R. (University of Iowa), Cedar Rapids, Iowa Sampsel, Charles F. (Gettysburg College), Bristol, Pennsylvania Saxer, Philip D. (University of Maine), Bangor, Maine Scofield, Michael S. (North Carolina State University), Princeton, New Jersey Seibert, Henry E. IV (Princeton University), Columbus, Ohio Settlemyer, William B. (Duke University), Short Hills, New Jersey Shearin, Ronald V. (Duke University), Warrenton, North Carolina Shenkin, Robert J. (University of Michigan), Wynnewood, Pennsylvania Shenkman, Jerrold (University of Florida), Brooklyn, New York Simpson, Robert L. Jr. (Duke University), Jacksonville, Florida Smith, James L. III (Dartmouth College), Fayetteville, Arkansas Stewart, William R. (Yale University), Cleveland, Ohio Taylor, Joe T. III (Duke University), Salisbury, North Carolina Torres, Ernest C. (Dartmouth College), New Bedford, Massachusetts Traver, E. Clifton (Cornell University), Great Neck, New York Volz, Marlin M. Jr. (Duke University), Louisville, Kentucky Voran, Brice T. (Yale University), Muncie, Indiana Wagner, Lynn E. (Drexel Institute), Maple Shade, New Jersey Walker, John R. (Virginia Military Institute), Memphis, Tennessee Weistart, John C. (Illinois Wesleyan University), Minonk, Illinois Wirtz, Frederick R. (Knox College), Chicago, Illinois Wright, William F. (University of Nebraska), Lincoln, Nebraska

Third Year

Adams, Charles F. (Duke University), Java, Virginia Adams, James A. (Duke University), Roscoe, New York Atwater, Luther E. (Duke University), Columbia, South Carolina Auerbach, Kenneth R. (Trinity College), Rye, New York Bacon, Richard G. (Villanova University), Wilmington, Delaware Banks, Lawrence K. (Duke University), Greensboro, North Carolina Barr, Stuart G. (Duke University), Staten Island, New York Barrier, W. Christopher (Hendrix College), Little Rock, Arkansas Beach, Lawrence W. (Bowdoin College), Sylvan, New York Bernard, Daniel F. (Iowa State University), Kenton, Ohio Berteau, John T. (Duke University), Lake Jem, Florida Bolch, Carl E. Jr. (University of Pennsylvania), Jacksonville, Florida Burkhardt, Clyde A. (Brown University), Southington, Connecticut Burton, Robert E. Jr. (Dartmouth College), Montchanin, Delaware Campbell, Frank A. Jr. (Duke University), Clearwater, Florida Campbell, George R. (Harvard University), Parkersburg, West Virginia Carter, Norman M. Jr. (Rutgers University), Plainfield, New Jersey Chiles, Stephen M. (Davidson College), Nokomis, Florida Clark, Roger M. (University of Utah), Hagerstown, Maryland Collier, Calvin (Grinnell College), Berwyn, Illinois Collins, Patrick H. (Colgate University), Gouverneur, New York Constangy, William (Wake Forest College), Atlanta, Georgia

Cooper, Norman G. (The Citadel), Bethesda, Maryland Craven, Donald B. (University of North Carolina), Roxboro, North Carolina Craven, James B. III (University of North Carolina), Morganton, North Carolina Crill, John L. (Allegheny College), Mercer, Pennsylvania Danner, Herbert A. (Yale University), Cincinnati, Ohio Davis, Linwood L. (Princeton University), Winston-Salem, North Carolina Davis, William A. II (University of North Carolina), High Point, North Carolina Dillon, W. Lyman (Davidson College), High Point, North Carolina Faulkner, Douglas A. (Earlham College), Ho-Ho-Kus, New Jersey Fink, Joseph A. (Oberlin College), Detroit, Michigan Fromholz, Haley J. (New York University), Darien, Connecticut Genders, Curtis D. (Florida State University), Sarasota, Florida Gordon, Richard A. (New York University), West Hempstead, L. I., New York Gormley, Thomas J. (Amherst College), Hartford, Connecticut Grissom, Hubert A. Jr. (Birmingham-Southern College), Cullman, Alabama Guthrie, George G. (Duke University), Charleston, West Virginia Hackett, Robert J. (Rutgers University), Allendale, New Jersey Hale, John S. (Ohio University), Cincinnati, Ohio Hamilton, J. Robert (Wabash College), Crawfordsville, Indiana Harrison, Frederick (Davidson College), Little Rock, Arkansas Hazen, Edwin R. (Lehigh University), Eric, Pennsylvania Heinly, James F. (Gettysburg College), Laneaster, Pennsylvania Hoernecke, Lutz B. (Columbia University), Williston Park, New York Hopper, Frederick C. (Beloit College), Taylorsville, Illinois Hunter, Robert C. (University of Pittsburgh), Pittsburgh, Pennsylvania Johnson, Hervey M. (Princeton University), Lumberton, North Carolina Johnson, Robert A. (Duke University), Hopewell, Virginia Jorgensen, Thomas A. (Columbia University), Silow Springs, Maryland Keating, Robert (Georgetown University), Brooklyn, New York Klingelhofer, Stephan E. (Yale University), Bethesda, Maryland Kuter, Stanley J. (Fordham University), Port Chester, New York Lathrop, Peter K. (Hamilton College), Ellenville, New York Lewis, Emmett B. III (Duke University), Akron, Ohio Lewis, John H. (University of Florida), Orlando, Florida Lincoln, Donald R. (Cornell University), Attiea, New York Livingston, Farrand M. (Kenyon College), Worthington, Ohio Lockwood, John A. (Colby College), Wilmington, Delaware McArthur, Matthew R. (Knox College), Park Forest, Illinois McCoy, Terrence L. (Dartmouth College), Louisville, Kentucky Mahoney, George R. Jr. (Ohio Wesleyan University), Southhampton, L.I., New York Melton, Thomas H. (Duke University), Huntington, West Virginia Meyers, David (Tulane University), St. Petersburg, Florida Moran, Charles A. (Georgetown University), Columbia, South Carolina Moye, Robert J. (Washington and Lee University), Arlington, Virginia Mullen, James N. (Duke University), Gastonia, North Carolina

Mullen, James N. (Duke University), Gastonia, North Carolina
Nabers, Wallace J. (Duke University), Wilson, North Carolina
Nathanson, Paul S. (Tulane University), North Miami, Florida
Norfolk, William R. (Miami University), Cincinnati, Ohio
Pancoast, David W. (College of Wooster), Lambertville, Michigan
Pieper, Nathaniel G. W. (Washington University), Coeur D'Alene, Idaho
Poe, Douglas (DePauw University), Flossmoor, Illinois
Remsburg, F. Raine (University of North Carolina), Goldsboro, North Carolina

Rich, Wayne A. Jr. (Colgate University), Charleston, West Virginia Rieder, Robert W. Jr. (Willamette University), Portland, Oregon

Riffle, Alan E. (Stetson University), DeLand, Florida

Riley, William L. (Williams College), Garden City, New York Rogers, William K. (University of Arizona), Tucson, Arizona Roth, Steven M. (Pennsylvania State University), Elkins Park, Pennsylvania Semonche, John (Brown University), Chapel Hill, North Carolina Serterides, Louis (Rutgers University), Jersey City, New Jersey Sheahan, Robert E. (Illinois Wesleyan), Riverdale, Illinois Sheffield, Homer G. (Duke University), Columbia, South Carolina Shelfer, William S. Jr. (North Georgia College), Atlanta, Georgia Sherman, Roger (Princeton University), Warrington, Florida Singer, William B. (Georgetown University), Cincinnati, Ohio Smith, Hugh N. (Lawrence College), Delaware, Ohio Smith, Lanty L. (Wittenberg University), Sherrodsville, Ohio Steinbrink, William H. (Wittenberg University), Richmond, Indiana Street, Malcolm B. Jr. (Birmingham-Southern College), Anniston, Alabama Stronach, George T. III (Atlantic Christian College), Wilson, North Carolina Stubbs, Trawick H. Ir. (University of North Carolina), Atlanta, Georgia Taylor, John C. (Juniata College), Huntington, Pennsylvania Thomasch, Roger P. (College of William and Mary), Philadelphia, Pennsylvania Todd, Daryl F. (University of Pennsylvania), Beach Haven, New Jersey Tracy, W. Ferber (Duke University), Salisbury, Connecticut Vieregg, Arthur B. (Duke University), Arlington, Virginia Ward, Mitchell E. III (University of Mississippi), Vicksburg, Mississippi Warnick, Reed T. (Brigham Young University), Wheatridge, Colorado Wehrle, Richard T. (Duke University), Charlotte, North Carolina Wildermuth, John G. (United States Military Academy), Ft. Bragg, North Carolina Williams, Terry L. (Ball State Teachers College), Anderson, Indiana Womble, William F. Jr. (Duke University), Winston-Salem, North Carolina Yule, Dennis D. (Seattle Pacific College), Shelton, Washington

Graduate Students

Chambers, Robin (Melbourne University), Hughesdale, Victoria, Australia Chou, Ming-an (Keio University, Japan), Kaohsiung, Taiwan Mendes, Antonio (Faculdade de Direito de Franca), Franca, Sao Paulo, Brazil Nagan, Winston P. (Oxford University), Port Elizabeth, South Osteen, Carolyn McCue (Duke University), Richmond, Virginia Tucker, James L. (College of William & Mary), Williamsburg, Virginia

Special Students

Paroutsas, Athanasios (National and Capodistrian University of Athens), Athens, Greece

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BULLETIN OF DUKE UNIVERSITY

Trinity College/The School of Engineering

Information and Regulations
1967 Second Edition





Annual Bulletins

For Bulletin of Information for Prospective Students, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The School of Engineering, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to The Dean of the Divinity School, Duke University, Durham, N. C.

For Bulletin of The School of Forestry, apply to The Dean of the School of Forestry, Duke University, Durham, N. C.

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BULLETIN OF DUKE UNIVERSITY

Information and Regulations

Trinity College The School of Engineering 1967

Second Edition

Durham North Carolina 1967

This bulletin is published to bring together information about regulations for students enrolled in Trinity College and the School of Engineering

The officers of these "colleges" will seek to keep this publication up to date, but reserve the right to alter or supplement these regulations at any time upon such notice to students as the officers deem suitable and within their discretion.

Please retain this bulletin for ready reference during the year.

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Registration

Semester Opening and Registration

Pre-registered students are expected to report to their college each semester by 6 P.M. on Registration Day. Failure to report entails a loss of the registration deposit (\$25.00) and registration in courses.

Identification Cards

Undergraduate students are issued two-part identification cards, which they should carry at all times. The cards are the means of identification for library privileges, student health services, athletic events, and other university functions or services open to them as university students. Students will be expected to present their cards on request to any university official or employee.

The cards are not transferable, and fraudulent use may result in loss of student privileges or suspension. A student should report the loss of this card immediately to his dean. A duplicate will then be issued upon payment to the Bursar of a replacement fee of \$5.00.

Pre-registration

Students pre-register in the fall or spring of the year for the next

semester on the basis of information and advising available to them at that time. Those who pre-register for either semester at a date later than that specified in the calendar of the colleges are subject to a penalty of \$5.00, payable to the Bursar. Students who do not pre-register within an allotted time must be readmitted to their college by application to the Director of Admissions.

Course Changes during the First Week

After pre–registration, course changes may be made on Registration Day or during the first week of classes. New courses may not be elected later than one week after the opening of classes for the semester. A student who wishes to withdraw from a course during the first week of classes should obtain his class card from his instructor and should secure his signature and those of his adviser (if he has selected a major) and dean.

Academic Regulations

Regulations Governing Courses

Normal Course Load

In Trinity College, the normal course program is 14 to 17 semester hours, exclusive of physical education, with the actual number of hours determined by the student's course of study. In the School of Engineering, the normal program is considered 15 to 17 semester hours, again

exclusive of physical education.

Since the University is committed to quality work and an education that is not exclusively course-centered, a student should weigh his reasons carefully before deciding to take a number of semester hours exceeding the normal load. A student who has earned less than a "C" average requires his dean's permission to carry 18 or 19 hours, and no student may exceed 19 semester hours, exclusive of physical education, except with permission.

Valid reasons for dropping below the normal course program may be excessive hours required for employment, special demands of independent study programs, or the normal demands of the senior year. In each

instance, the student must have the approval of his dean.

Special Student Status. Where unusual circumstances make it wise, and permission of his dean is secured, a student may register on parttime degree (special) status for no more than two courses with a maximum credit of eight semester hours. For information regarding the reduced fees assessed in this instance, see the Bulletin of Undergraduate Instruction.

Auditing Courses

With the consent of the instructor, a student taking a normal load may in addition audit one or more courses. An auditor does not submit class work, take any tests, or receive a grade, but is expected to attend classes throughout the semester. After the first week of classes, a student may not shift from credit to audit basis in a course nor may he in a later semester take for credit a course he has previously audited.

Pass-Fail Option in Courses (Beginning February, 1967)

With the consent of the instructor, a third or fourth year student may choose to be graded on a pass-fail basis in one elective course each semester. A student accepted on this basis completes all the work of the course but receives either a pass (P) or fail (U) grade in lieu of a standard mark. The credit hours earned apply only to the total cumulative average (see p. 9), as do transfer and Advanced Placement credits. For that reason they are weighted as "C's" toward the required senior "C" average. A pass grade may not subsequently be converted to a regular letter grade.

Dropping Courses after the First Week

If a student wishes to withdraw from a course after the initial week, he should confer with his instructor about his course performance and then discuss the situation with an academic dean in his college. Should the student conclude that it is in his best interest to withdraw, he should obtain a class card, the signatures of both the instructor and his adviser (if he has declared a major), and return to his dean for his approval.

A student may drop a course officially within the early weeks of a semester without penalty if he is clearly overloaded. For freshmen this period is extended to the time when six-week advisory grades are received; for upperclassmen it is extended until November 1 for the fall semester and March 1 for the spring. Factors such as illness or poor health and necessary outside work will also be taken into consideration in assessing whether withdrawal without penalty is permissible. A "W" will be entered opposite the course on the record in lieu of a grade in all cases when withdrawal without penalty is approved. After the above dates, withdrawal will ordinarily incur a penalty "F." A course dropped without approval at any time will be assigned an "F." A course that has been dropped must be retaken in its entirety to receive credit.

Declaration of Major

The second semester of the freshman year is the earliest opportunity for a student to declare his major field of concentration and be advised formally by a faculty member from his major department. All students in Trinity College are to choose a major no later than the spring semester of their sophomore year; students in the School of Engineering may defer the decision until midway through their junior year.

Make-up of Examinations and Course Incompletes

When a student is absent from a final examination, he receives an "X" instead of a final grade. It is the student's responsibility to present an acceptable explanation for his absence to his dean within 48 hours after the scheduled time of the examination. Failure to do so causes the "X" to be changed to an "F."

It is the policy of the undergraduate colleges not to permit re-examinations. When a student has been excused from an examination, it is his responsibility to confer with the instructor of the course involved to arrange a make-up. The time of the new examination is set at the discretion of the instructor. An "X" not cleared by the end of the succeeding semester is changed to an "F."

If because of illness or some other emergency a student's work prior to the final examination is incomplete, he may receive an "I" for the course instead of a final grade. It is his responsibility to arrange to complete the work before the close of the succeeding semester, otherwise the "I" is changed to an "F."

Quality Points, Continuation Requirements, and **Class Standing**

An overall indication of the quality of student performance is provided by assigning quality points per semester hours of a course as follows: A = 4, B = 3, C = 2, D = 1, and F = 0. The Duke Cumulative Average (DCU) is maintained for each student by dividing the number of quality points earned at Duke by the total number of hours carried-not semester hours passed-at Duke. Hours for courses in which an "X" or "I" has been given are included in the total hours carried.

In addition the Total Cumulative Average (TCU) is maintained which includes all work for which credit toward graduation is granted, with two quality points per semester hour assigned to work transferred from other institutions or assigned for advanced placement.

Rank in class and all honors at Duke are determined on the basis of

the Duke Cumulative Average; however, in Trinity College the Total Cumulative Average is the basis for determining whether continuation and graduation requirements have been met.

Trinity College

In Trinity College a student must achieve at least the following for continuation from

The first to the second year......18 s.h. credit and a q.p.r. of 1.30 The second to the third year.....42 s.h. credit and a q.p.r. of 1.60 The third to the fourth year......66 s.h. credit and a q.p.r. of 1.70 The fourth to the fifth year (if needed) 90 s.h. credit and a q.p.r. of 1.80

Freshmen must pass at least six semester hours of work in their first semester, nine semester hours in the second semester, and a total of 18 semester hours in their first year; all other students must pass at least nine semester hours each semester. Physical education credits are excluded in each case.

Senior Class Privileges

Students who have completed 90 or more semester hours of work and have attained a quality point ratio of at least 1.80 are eligible for privileges normally accorded seniors.

Requirements for Graduation

For graduation from Trinity College in addition to completion of an approved curriculum, a student must meet at least the following minimum requirements: the completion of 124 semester hours with 248 quality points and a q.p.r. of 1.90. The student must also maintain at least a "C" (2.00) average for all work taken in the senior year.

School of Engineering

A student matriculating after September 1, 1965, must achieve at least the following for continuation from

Freshmen must also pass at least six semester hours of work in their first semester, three required courses in the second semester, and 18 semester hours in the first year; all other students must pass at least nine

semester hours each semester. Physical education credits are excluded in each case.

Senior Class Privileges

Students who have completed 96 or more semester hours of work including certain specially designated junior courses are eligible for privileges normally accorded seniors.

Requirements for Graduation

For graduation from the School of Engineering in addition to completion of an approved curriculum, a student matriculating after September 1, 1965, must meet at least the following minimum requirements: the completion of 134 semester hours; a cumulative q.p.r. of 1.90; and a q.p.r. of 2.0 in all work, as well as in all engineering work, taken after senior standing is attained.

Credits

Transfer of Credit for Courses Completed Elsewhere

The transfer of credit for a course completed at another college or university to Duke can be arranged if the school is accredited by a regional accrediting association and a grade of "C" or higher has been earned in the course.

No credit is given for courses completed by correspondence, and credit for no more than six semester hours is allowed for extension courses.

It should also be noted that only credit (semester hours) is transferred. A grade is not entered on the Duke record, and graduation-level quality points (2.0) are assigned for record-keeping purposes.

For information on programs for Study Abroad or procedures relating to Advanced Placement credit, see the Bulletin of Undergraduate Instruction.

Reciprocal Agreement with the Consolidated University of North Carolina

Students regularly enrolled in Duke University and paying full fees may be admitted to a maximum of two approved courses per semester at the Consolidated University of North Carolina during the regular academic year upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. One such course may be elected per summer session by a student paying full Duke fees. A student who is interested should see his dean.

Residence Requirements

The final four semesters-or the equivalent-of work must be earned in residence except in those instances in which a student has been approved to take his junior year abroad. For engineering students, 30 of these 60 semester hours must be from those normally taken in the senior year. A student who meets this requirement but who still lacks six to eight semester hours in final fulfillment of requirements may take this work in another accredited institution, provided the work is approved by the director of undergraduate studies of his major department and by his dean.

Summer School Credit

A student may pre-register for courses in the Duke Summer Session at the time of the regular pre-registration for the fall semester or at any time prior to the start of either term of the summer session. He is assured a place in a particular course when he has completed his registration by

paying the tuition for the course.

A student wishing to elect summer work at another college should obtain its summer catalogue and secure the approval of his academic dean and the appropriate director of undergraduate studies at Duke. Work can be taken at any accredited college or university, or may be taken at an accredited junior college if completed prior to the conclusion of a student's second year at Duke. In general, a student may transfer course credit for only as many hours of work as there are weeks in the summer session where he takes the course(s).

Attendance Regulations

The attendance regulations specifically place the responsibility for class attendance upon the individual student. He is expected to attend classes regularly and punctually. A student should recognize that one of the most vital aspects of a residential college experience is attendance in the classroom and that the value of this academic experience cannot

be fully measured by testing procedures alone.

Members of the student body are considered to be sufficiently mature to appreciate the necessity of regular attendance, to accept this personal responsibility, and to demonstrate the kind of self-discipline essential for such performance and, conversely, to recognize and accept the consequences of failure to attend. An instructor is privileged to refer to the dean of the appropriate college for suitable action students who in his opinion are causing their work or that of the class to suffer because of absences or latenesses.

Absences from tests and required classes due to illness will be excused when certified by a proper medical official. When ill a student should report to the Student Health Office immediately in advance of any tests. Absences due to authorized representation of the University may be excused. Excuses are issued at a student's college office.

Withdrawal from the Undergraduate Colleges

A student who wishes to withdraw must give official notification to his dean. Withdrawals at student initiative prior to the Christmas recess in the fall term or prior to April 15 in the spring term are coded as voluntary, and a "W" is entered in lieu of a grade for each course. Voluntary withdrawals after these dates are permitted only in the event of emergencies beyond the control of the student.

Leaves of Absence

Leaves of absence may be arranged for students in good standing who have been approved to participate in Study Abroad Programs (see Bulletin of Undergraduate Instruction).

Transfer between Duke Colleges

A student may transfer from one Duke undergraduate school or college to another only upon written application and with the approval of the officers of the undergraduate colleges involved. The review of a student's request to transfer will involve consideration of his general academic standing, citizenship record, and relative standing among the group of students applying for transfer. The college to which transfer is sought will give academic counseling to a student as soon as his intention to apply for transfer is known, although no commitment will be implied in doing so. A request to transfer should initiate in the college in which the student is presently enrolled.

Readmission

Applications for readmission are made to the Undergraduate Admissions Office. Such applications are reviewed by officers of the college to which the student applies. They are reviewed on the basis of several criteria including his academic record at Duke and prospects of completing requirements for graduation; his citizenship record at Duke and evidence of increasing maturity and self-discipline; the degree of success attendant upon the activities in which he has engaged while away from Duke; and, finally, his relative standing among the group of students applying for readmission. Following the evaluation, a recommendation is made by the college officers with regard to readmission. The Admissions Office then notifies the applicant of the action taken.

Nonacademic Regulations

General Conduct

Trinity College and the School of Engineering expect of their students loyal and hearty cooperation in developing and maintaining high standards of conduct as well as of scholarship. General regulations concerning conduct of undergraduate men are outlined in the Student Judicial Code that follows. The student, in accepting admission, indicates his willingness to subscribe to these regulations and the right of the college to require his withdrawal if he fails to abide by them or if his conduct is unsatisfactory in the judgment of the officers of his college.

General oversight of the conduct of students and the administering of discipline are under the supervision of the deans of the colleges. Immediate supervision of freshmen is entrusted to the Dean of Freshmen and of upperclassmen to the Dean of Men; however, through the expressed willingness of the students in the colleges to assume the responsibility of maintaining high standards of morality, their student bodies have become self-governing to a great degree. A Judicial Board, composed of students duly selected by the Men's Student Government Association, exercises the authority granted the students by the officers of their respective colleges to investigate all cases of misconduct, as well as all other cases of violation of proper standards and traditions, and to recommend to college officers penalties based on their findings.

The Judicial Code

The Judicial Code (as revised in April, 1966, and adopted by the Men's Student Government Association) follows:

Students of the undergraduate colleges of Duke University are required to maintain at all times a high standard of private and public behavior on the University campus and within its environs. Any breach of the generally accepted rules of gentlemanly conduct, honor, or decency which directly reflects upon the University, whether or not covered by the following specific regulations, will be subject to appropriate disciplinary action, which may include expulsion. Claims of ignorance of such high standards and commonly accepted rules of conduct or of the following specific regulations will not be accepted as an excuse for their violation.

Section 1. The following actions are deemed to be extremely serious to the well-being of the Duke University Community. These offenses shall be treated accordingly by the judicial organs of the Association. Those found guilty of these offenses shall be liable to expulsion as the maximum penalty.

- A. Cheating or plagiarism
- B. Forgery
- C. Assault and battery
- D. Theft
- E. Violation of women's living quarters
- F. Perjury
- G. Fraud (including falsification of auto registration, meal tickets, library slips, laundry slips, or student identification cards)
- H. Willful and malicious damage of University property or property of others
 - I. Illegal use or possession of firearms and ammunition, or explosives
- J. Accumulated convictions of any of the offenses listed under Section

Section 2. The following actions are deemed to be serious offenses against the Duke University Community. These offenses shall be treated accordingly by the judicial organs of the Association. Those found guilty of these offenses shall be liable to suspension as the maximum penalty.

- A. Brawling
- B. Drunkenness involving disorderly conduct
- C. Violation of examination procedure
- D. Aiding and participation in any form of mob violence (including rioting)
- E. Gambling

- F. Violation of the freshman car regulation
- G. Possession or use of fireworks
- H. Reckless driving
- I. Drinking on the University grounds or in its public buildings
- J. Violation of West Campus, East Campus, or Hanes House visiting regulations
- K. Violation of suspended driving status
- L. Lying
- M. Obscenity

Section 3. The following actions are deemed to be less serious offenses against the Duke University Community. These offenses shall be treated accordingly by the judicial organs of the Association. Those found guilty of these offenses shall be liable to disciplinary probation as the maximum penalty.

- A. The display of alcoholic beverages on the University grounds or in its public buildings
- B. Rowdiness
- C. Participation in any form of "quad ball"
- D. Failure to respond to the summons of a court established by the Men's Student Government Association
- E. Running from a campus policeman

Section 4. Penalties which the judicial organs may recommend for the offenses against the University shall include the following which shall be defined as follows:

- A. Expulsion: Immediate dismissal from and denial of readmittance to Duke University.
- B. Suspension: Dismissal from Duke University with the right to be readmitted when the appropriate "College" permits.
- C. Suspended Suspension: Technical suspension from school, with continuation in school contingent on good behavior and satisfactory academic performance. For the following two semesters the person's citizenship and academic records are reviewed, continued good behavior and satisfactory academic performance being the criteria for remaining at Duke University.
- D. Probation: Probation for two semesters and the threat of suspension if again apprehended committing the same offense or one of equal or worse nature. The person's citizenship or academic record, or both, is reviewed for two semesters. An unsatisfactory record may lead to suspension.
- E. Administrative "F": A failing grade assigned in cases of cheating or plagiarism.

- F. Dean's Reprimand or Board Reprimand: Reprimand by the Dean or Board according to the nature of the offense. These penalties will be given in cases where the seriousness of the offense does not warrant any of the above penalties.
- G. Suspension of Driving Privileges: Suspension of driving privileges in cases involving motor vehicles.
- H. Fines: Imposition of a fine appropriate to the nature of the offense; conviction of "quad ball" carries a \$5, \$10, or \$15 fine for the first, second, or later offense, respectively, within a single academic year. Conviction of use of fireworks carries a \$25 fine in addition to other penalties which may be imposed. Fines for other convictions may be levied at the discretion of the Board.

Registration and Storage of Guns and Other Firearms

Students bringing firearms to Duke must register them in the Office of the Dean of Men. Ownership and use of firearms must also comply with all local and State laws. Illegal possession or use of firearms at Duke may result in expulsion from the University.

The State of North Carolina requires that all firearms having a barrel length of eighteen inches or less must be registered at the county courthouse. In Durham, this registration is made at the Office of the Clerk of the Superior Court.

All firearms belonging to undergraduates must be stored in the West Campus Security Office; students are not permitted to keep them in their rooms. Instructions for the storage and use of firearms are given at the time of their registration in the Office of the Dean of Men.

Motor Vehicle Regulations

In accordance with the policy of the men's undergraduate colleges, freshmen may not have in their possession or operate motor vehicles (including motorcycles and motorbikes) at the University during the Fall semester. In the Spring semester, they may operate, but not possess, motor vehicles. Vehicles may not be stored in the vicinity or in a nearby town or city for use within Durham or for the purpose of taking trips outside the city limits. Violations of these regulations usually result in immediate suspension.

Freshmen in the following categories may be exempted from this regulation after making written application to the Dean of Freshmen and receiving written permission to bring their cars:

- a. Students living with their families in the city of Durham.
- b. Students commuting daily to the University.

Members of the upper classes of Trinity College and the School of Engineering who wish to possess and operate motor vehicles at Duke may do so after registering them at the Traffic Office. Students under 21 years of age must have the written consent of parent or guardian before possessing and operating their own motor vehicles at Duke. A standard certificate of automobile liability insurance issued by a recognized company and evidencing coverage of at least \$5,000 per person and \$10,000 per accident for personal injury and \$5,000 for property damage is also required. There is a registration fee for resident students of \$30.00 per automobile or \$10.00 per motorcycle, motorbike, or motor scooter for each academic year.

Vehicles must be registered annually at the beginning of the Fall semester or, if a vehicle is acquired later, within five days after bringing it to the campus. If there is a change of status which requires that a new registration emblem be displayed or affects the registration fee, a

student must re-register his vehicle within five days.

Residential Arrangements and Regulations

Rental Procedures

A \$25.00 room deposit is required before a student may reserve a room. Once he matriculates, the deposit is held for the entire period of his academic enrollment. The deposit is refundable under the conditions described in the chapter "Financial Regulations."

Rooms are normally rented for the academic year; rental payments, however, may be made by the semester. All payments must be made in advance to the Bursar. After the day of registration, room rent will not be refunded except to those students who withdraw involuntarily to enter the Armed Services of the United States.

Occupancy

Rooms within the residence halls may be occupied by freshmen on the first day of Freshman Week and by upperclassmen 48 hours before the day the colleges open. All rooms must be vacated 24 hours after the close of the period of rental, which is the last day of final examinations, except those students who are graduating may stay until after commencement exercises. A student must remove all personal effects from his room prior to departure.

Room Regulations

Student Possessions in Room

The following items are not permitted in rooms in the residences:

- 1. Furniture other than that provided in the residence halls by the University unless approved by the Director of Housing. (Exceptions are that small radio, phonograph, or television tables are permissible without reference to the Director of Housing.)
- 2. Pets of any sort.
- 3. Cooking appliances, except electric coffee-makers with self-contained elements.
- 4. Personally owned refrigerators. (Refrigerators may be rented from the University under conditions established by the Director of Housing.)

Care of Rooms and Adjacent Campus Areas

Though limited maid service is available, a student is responsible for the care of his room and furnishings and is required, as a condition of occupancy, to keep his room reasonably clean and orderly. The University reserves the right to enter and to inspect the condition of any student's room.

Nails, screws, tacks, or adhesives on the walls or woodwork of the residences are prohibited. The utilities, wiring, locks, or screens should not be altered. No student shall remove University furniture or equipment from his room.

Games which may damage lawns or shrubbery adjacent to residence halls are not permitted.

Guests

Women guests are permitted in the social rooms on Friday, Saturday, and Sunday from noon to 7 P.M. and are permitted on other occasions only by special permission from the Dean of Freshmen or the Dean of

To provide hospitality for overnight men guests, beds or cots may be secured through the Housing Bureau.

Damage Charges

Students must report within five days after moving into a room any earlier damage that has not been repaired in order to be released from financial responsibility. A form used for reporting these damages to the Housing Bureau will be provided at the time of occupancy.

Students will be held responsible for damage that occurs in their rooms even though they may be absent at the time. Any repair costs will be assessed the occupant(s) of the room. An appeal for reassignment of costs should be made through the Director of Housing to the Court of Appeals.

Room Changes

Room changes may be made when approved by the living group housing chairman, resident, or housemaster and the Supervisor of Residences. No charge will be made for these changes until October 1 for the fall term or until February 16 for the spring term. After these dates, a charge of \$2.00 will be assigned for room changes. An unofficial room change will make the student liable for payment of rent for each room for the period involved.

Vacancies

- 1. Vacancies in a multiple occupancy room. Rooms are usually rented as doubles and singles. If necessary, some rooms may be temporarily set up for multiple occupancy. Such rooms will be changed as soon as possible to their original status, as double or single rooms, and the remaining occupant(s) required to pay the cost differential. A student remaining in a single room will be given the opportunity to move to a double room if he so desires.
- 2. Vacancies in a normal occupancy room. When a vacancy occurs in a normal occupancy room in an established living group, the designated authorities of that living group will be notified by the Supervisor of the Men's Residential Program and will be expected to consult with the remaining occupant and fill the vacancy within one week of notification. If the vacancy is not filled within that time, the vacancy will be filled by the Supervisor of the Men's Residential Program. If this vacancy cannot be filled in either of the above described manners, then the remaining occupant will be required to:
 - a. Move to another room in which a vacancy exists, or
 - b. Arrange to pay the prorated differential cost resulting from the vacancy.

When a vacancy occurs in a normal occupancy room in an area not reserved for a special living group, the remaining occupant will be expected within a week after official notification by the Supervisor of Men's Residential Program either to:

a. Select a roommate or accept a roommate, if available, assigned by the Supervisor of Men's Residences or

b. Move to another room in which a vacancy exists, or

c. Arrange to pay the prorated differential cost resulting from the vacancy.

Storage

Within two weeks after room occupancy, all trunks and heavy luggage must be stored in a storage area designated for each residence. Limited facilities are available to students who have pre-registered for the fall semester for storing personal effects over the summer. Non-students or students living off campus cannot store their personal effects in the residence halls. Storage will be limited to trunks and boxed items no larger than the average trunk; each student will be expected to deliver and pick up his belongings. Each item must be well marked with the owner's name and his permanent mailing address. Receipts will be given at the time of delivery and must be shown by a student to remove his items from storage. The University assumes no financial responsibility for damages to or loss of personal property.

Trading and Soliciting

Without written permission from the Dean of Men, no student, tradesman, or salesman may solicit or sell goods or services in the buildings or on the grounds of Duke University. A student who invites or receives an unauthorized salesman, or who uses his room for any commercial purpose, is liable to disciplinary action.

Medical Care

Student Health Service

The Student Health Service is closely related to the teaching hospital of the Duke University Medical Center. This arrangement provides an unusually comprehensive service, available at all times. The cost, for regularly enrolled students, is included in the general fee paid each semester, and in the fees charged each student in the summer session. If students also have insurance providing hospitalization, surgical, or medical benefits, the benefits are applicable to the cost of their medical care.

The Service is under the direction of the University Physician, with the cooperation of the staff. It includes hospitalization in Duke Hospital, as deemed necessary by the hospital staff, but is limited to 30 days per illness; medical and surgical care under the supervision of a senior physician or surgeon; drugs, x-ray work, and ward nursing. Students pay for board while in the hospital. Refraction of eyes and treatment of teeth and of all chronic and pre-existing conditions (such as diseased tonsils, hernias, pilonidal cysts, and other elective surgery, chronic skin conditions, and endocrine disturbances) are not included. The cost of special nursing and any necessary braces and orthopedic appliances must be borne by the student. Blood used for transfusions must either be paid for or replaced.

Accidents or illnesses occurring during vacations or while students are away from the campus are not included in this service. A special com-

mercial policy available only to regularly enrolled Duke students, if desired, furnishes complementary protection. Information will be furnished by the Bursar.

Advisory consultation with a psychiatrist is available at no expense to students through referral either by physicians from the Student Health Service or by the deans of the colleges, but office visits for psychotherapeutic interviews are not included in this service.

When classes are in session, male students may receive ambulant care at the Student Health Office from 7:45 A.M. to 5:30 P.M. week days and 7:45 A.M. to 1 P.M. on Saturdays. During examination periods the office does not open until 9 A.M. Emergency service and the consulting services of specialists in the Hospital and Medical School are always available.

Emergency Treatment for Nonambulatory Students

When a student requires immediate medical attention as a result of an accident or other incident on campus and is unable to go to the Emergency Room of the Medical Center by himself or with assistance, the Campus Security Office, Extension 2444, should be called to request that a University police car come to the scene of the accident. If the patient can be moved, a security officer is authorized to transport him to the Emergency Room.

If medical assistance is needed before moving the patient, a call should be made to the Emergency Room, Extension 2413, to request that the Senior Assistant Resident in Medicine come to the scene of the accident.

He will be brought by a campus security officer.

Financial Regulations

Fees and Expenses

Tuition and fees for undergraduates average \$818.50 for each semester of the regular academic year. This includes tuition, laboratory, gymnasium, library, student health, and graduation fees. Information about insured tuition payment plans acceptable to the University may be obtained from the Office of the Bursar. Additional charges will be made for accommodations in residence halls, meals, and for such extras as election of courses in golf or digital computation, the registration of a car, and damages to University property caused by the student.

By majority vote, each residence hall establishes dues to cover the cost of social and other house-sponsored activities. All residents are re-

quired to pay house dues.

Charges for a year's rental in Kilgo, Craven, Crowell, Few, and Wannamaker Quadrangles are as follows: for a single room, \$380.00; for occupancy in a double room, \$310.00; for occupancy in a triple room, \$285.00. In the new residence halls, charges for a year's rental are: for a single room, \$425.00; for occupancy in a double room, \$355.00 per year.

For matriculated students, \$25.00 of the \$50.00 deposit made at the time of acceptance serves as a continuing room deposit and the remaining \$25.00 as a continuing registration deposit. The \$25.00 registration deposit will be refunded to students (1) whom the University does not

BULLETIN OF DUKE UNIVERSITY

Information and Regulations

Trinity College
The School of Engineering
1967

Second Edition

Durham North Carolina 1967

This bulletin is published to bring together information about regulations for students enrolled in Trinity College and the School of Engineer-

ing.

The officers of these "colleges" will seek to keep this publication up to date, but reserve the right to alter or supplement these regulations at any time upon such notice to students as the officers deem suitable and within their discretion.

Please retain this bulletin for ready reference during the year.

permit to return, (2) who are graduated, or (3) who request the refund at the time of pre-registration, thus indicating their intention not to return for the following semester. The continuing room deposit will be refunded within 30 days after a student's graduation or upon withdrawal from one of the residences by a student enrolled on a semester basis, providing he has given written notice to the Director of Housing before August 1 to cancel a reservation for the fall semester, and not later than January 15 to cancel a reservation for the spring semester. A student will be expected to check out of his room, give the Director of Housing notice that he has done so, and settle his account with the Bursar before the refund is made.

The inclusive fee due each semester is payable to the Bursar not later than the day of registration. Refund of this fee will be made after the day of registration only in cases where a student leaves involuntarily to enter the Armed Services.

Students who register in either semester at a date later than that prescribed in the calendar of the colleges must pay to the Bursar a fee of \$5.00. Ghanges in courses for reasons of personal convenience incur a fee of \$1.00.



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BULLETIN OF DUKE UNIVERSITY

School of Medicine and Medical Center 1967



Annual Bulletins

For Bulletin of Information for Prospective Students, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The School of Engineering, apply to The Registrar, Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to The Dean of the Divinity School, Duke University, Durham, N. C.

For Bulletin of The School of Forestry, apply to The Dean of the School of Forestry, Duke University, Durham, N. C.

For Bulletin of The Graduate School of Arts and Sciences, apply to The Dean of the Graduate School, Duke University, Durham, N. C.

For Bulletin of The School of Law, apply to The Dean of the School of Law, Duke University, Durham, N. C.

For Bulletin of The School of Medicine, apply to The Dean of the School of Medicine, Duke University, Durham, N. C.

For Bulletin of The School of Nursing, apply to The Dean of the School of Nursing, Duke University, Durham, N. C.

For Bulletin of The Summer Session, apply to The Director of the Summer Session, Duke University, Durham, N. C.

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BULLETIN OF DUKE UNIVERSITY

School of Medicine and Medical Center 1967

Durham, North Carolina 1967



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Medical School Calendar

1967-1968

June

Begin summer session (1, 2, 3, 4*)

July

Independence Day holiday

August

- 4 End summer session (2, 3)
- 18 End summer session (4)

September

- 5 Registration and first day of term (1, 2, 3, 4)
- 6 Examination day (1)

November

- 3 End first term (4)
- 6 Begin second term (4)
- Thanksgiving Day holiday

December 16 through January 1 (inclusive)

Christmas holiday

January

- 2 Classes resume (1, 2, 3, 4)
- 19 End second term (4)
- 22 Begin third term (4)

March

- End third term (4)
- *(1) First Year Class; (2) Second Year Class; (3) Third Year Class; and (4) Fourth Year Class

March 23 through March 31 (inclusive) Spring vacation (4)

March 30 through April 7 (inclusive)
Spring vacation (3)

April

Begin fourth term (4)

April 6 through April 14 (inclusive)
Spring vacation (1, 2)

May

30 Examination day (1, 2, 3)

31 End fourth term (4)

June

3 Commencement

17 Begin summer session (1, 2, 3, 4)

August

16 End summer session (1, 2, 3, 4)

September

3 Registration and first day of term (1, 2, 3, 4)

4 Examination day (1)

November

21 Thanksgiving Day holiday

December 21 through January 6 (inclusive)
Christmas holiday

Officers of Administration

General Administration

Douglas Maitland Knight, Ph.D., LL.D., Litt.D., L.H.D., President Robert Taylor Cole, Ph.D., Provost

Frank Leon Ashmore, A.B., Vice President for Institutional Advancement Gerhard Chester Henricksen, M.A., C.P.A., Vice President and Treasurer Everett Harold Hopkins, M.A., LL.D., Vice President for Planning and Institutional Studies, Assistant Provost

Charles B. Huestis, Vice President for Business and Finance

Frank Traver de Vyver, Ph.D., Vice Provost

Harold Walter Lewis, Ph.D., Vice Provost, Dean of Arts and Sciences

Richard Lionel Predmore, D.M.L., Vice Provost

Barnes Woodhall, M.D., Vice Provost

Craufurd David Goodwin, Ph.D., Assistant Provost

Robert H. Ballantyne, Ed.D., Assistant to the President for Planning

Benjamin Edward Powell, Ph.D., Librarian

Richard Lovejoy Tuthill, Ed.D., University Registrar

Rufus H. Powell, LL.B., Secretary of the University

Edwin Constant Bryson, LL.B., University Counsel

Duke University Medical Center

Barnes Woodhall, M.D., Vice Provost

William G. Anlyan, M.D., Dean, School of Medicine

Jane G. Elchlepp, M.D., Ph.D., Assistant Dean, Planning

E. Croft Long, M.B., B.S., Ph.D., Assistant Dean, Medical Student Affairs William M. Nicholson, M.D., Assistant Dean, Postgraduate and Continuing Education

Suydam Osterhout, M.D., Assistant Dean, Admissions

Helen T. Kotin, M.D., Assistant Dean, Research

Herbert O. Sieker, M.D., Assistant Dean, Coordination of Educational Affairs

S. Douglas Smith, M.H.A., Assistant to the Dean

Ann M. Jacobansky, M.A., Dean, School of Nursing

Charles H. Frenzel, A.B., Administrative Director, Medical Center

Virginia Stone, Ph.D., Director of Graduate Studies, School of Nursing

Medical School Advisory Committee

William G. Anlyan, Dean of the School of Medicine and Chairman of the Medical School Advisory Committee

Barnes Woodhall (ex-officio), Vice Provost

Charles H. Frenzel, Professor of Hospital Administration and Administrative Director, Medical Center

Other members: The heads of all departments in the Medical School

Standing Committees of The School of Medicine

Admissions

Suydam Osterhout (*Chairman*), Boyarsky, Byrne, Cherny, Duke, Fetter, Kaufman, McCollum, Portwood, Rhoads, Salzano, H. Thompson, R. Thompson (*Executive Secretary*)

Beaumont

D. B. Hackel (Chairman), Metzgar, Salzano, Shingleton, Whalen, Le-May, S. D. Smith

Borden Award

J. P. Hendrix (Chairman), Kamin, Kaufman, W. Smith

Cancer Training

W. W. Shingleton (Chairman), P. Cavanaugh, Harris, Kinney, Laszlo, G. Wilbanks

Cardio-Vascular Training

K. S. Grimson (Chairman), Harris, McIntosh (ex-officio), Stead, Tosteson, Lester

Committee on Clinical Experimentation

M. D. Bogdonoff (Chairman), S. Cohen, Davidson, Rundles, Shingleton, Stempfel, Thiers, Sidbury, Lack, J. G. Smith, Gibbs, Raben, Christakos

Clinical Service Laboratories

T. D. Kinney (Chairman), Frenzel, Osterhout, P. Smith, Thiers

Continuation Education

W. M. Nicholson (Chairman), Baylin

Curriculum

H. O. Sieker (Chairman), Callaway, Christian, DeMaria, Glenn, Gross, Hackel, Hine, Long, Lynn, Moses, Preiss, Stempfel, Lester, Young

Davison Scholarship

E. C. Long (Chairman), Nashold, W. P. J. Peete. (Plus two student representatives)

Durham Veterans Hospital Dean's Committee

W. G. Anlyan (Chairman), Estes (Vice-chairman), Busse, Kinney, Lester, Sabiston, Stead

Educational Policies

H. O. Sieker (Chairman), Goldner, Hackel, Moses, Renkin, Rhoads, Stempfel, D. S. Smith, Gover, Flanagan

Hanes and United Fund

D. T. Smith (Chairman), Kaufman, Long, Harris, Semans

Hospital Advisory

C. H. Frenzel (Chairman), Anlyan, Woodhall, Busse, J. S. Harris, Jennings (ex-officio), Kinney, R. Parker, Lester, Sabiston, Stead, Wadsworth. Estes

Hospital Records

E. L. Persons (Chairman), Mrs. Kernodle, Miss Clark, Goldner, Sabiston, **Jennings**

Isotope

H. Kamin (Chairman), Lester, Harris, Sanders, Tyor, Jennings, C. Knight, Goodrich

Library

M. D. Bogdonoff (Chairman), Bernheim, Cavanagh, R. Hill, Hine, Long, Karcz, Nashold, Sabiston, D. T. Smith, one medical and one nursing student representative

Medical Center Facilities

L. Swanson (Chairman), Cherny, Estes, Kaufman, J. W. Moore, W. Wilson, Young, Elchlepp, Nolan, Lester



Medical Education for National Defense

Donald Silver (*Chairman*), Bassett, Frenzel, Georgiade, Mitchell, B. Worde, Christakos, Jaeger, Straube, Spradlin, Spock, Gunnells, Anlyan (ex-officio)

Out-Patient Policy

R. Parker (Chairman), Bogdonoff, DeMaria, Jaeger, Llewellyn, W. P. J. Peete, Chandler

Physical and Occupational Therapy

F. W. Clippinger (*Chairman*), Frenzel, Huckabee, Kaiser, Lowenbach, Markee, Persons

Rehabilitation Advisory

R. A. Gregg (Chairman), Bogdonoff, Clark, Clippinger, Jennings, Kaiser, Lawrence, Nashold, Semans

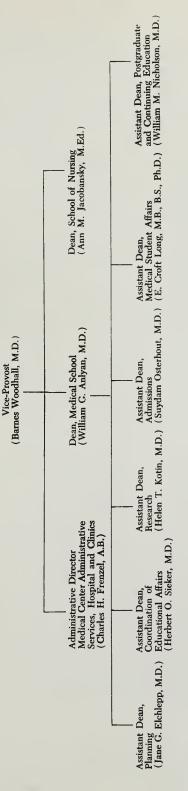
Social Service

W. M. Nicholson (Chairman), Busse, Carter, Frenzel, Harris

Student Fellowships

E. C. Long (Chairman), Sealy, Sidbury

Administration of Duke University Medical Center



Duke Hospital

Administrative Staff

Charles H. Frenzel, Administrative Director and Professor of Hospital Administration

Louis E. Swanson, Assistant Administrative Director and Associate Professor of Hospital Administration

Ralph E. Jennings, Assistant Administrative Director and Instructor in Hospital Administration

Boi Jon Jaeger, Assistant Administrative Director and Director of Outpatient and Extension Services

Kenneth J. Schoonhagen, Administrative Assistant

James W. Anderson, Business Officer

Francis N. Gay, Personnel Director

Paul W. Aitken, Chaplain

Private Diagnostic Clinic Staff

Clarence H. Cobb, Business Manager, Medical Division and Instructor in Hospital Administration

Roy N. Crenshaw, Business Manager, Surgical Division Ralph Hawkins, Assistant Business Manager, Medical Division H. D. Maynard, Assistant Business Manager, Surgical Division George A. Whiteside, Assistant Business Manager, Medical Division

Technical Staff and Heads of Hospital Divisions

Harry Gardner, Superintendent, Building Operations
Dorothy Ellen Tate, Director and Associate Professor of Dietetics
I. Thomas Reamer, Pharmacist and Associate in Pharmacy
Betty W. Kernodle, Director, Medical Record Department
Lelia R. Clark, Director, Nursing Service and Professor of Nursing
Helen L. Kaiser, Director and Associate Professor of Physical Therapy
Bert R. Titus, Director and Assistant Professor of Orthosis and Prosthesis

Martha J. Scoggins, Executive Housekeeper

Cecil Carden, Supervisor, Printing Department

Leatrice B. Emory, Supervisor, Electrocardiographic and Basal Metabolic Laboratory

Warren E. Wagner, Manager, Storeroom

Preston W. Smith, Supervisor, Private Medical Laboratory and Technical Associate in Laboratory Science

Edward T. Parrish, Manager, Laundry

Gretchen J. Cheek, Central Supply Services

Sara J. Dent, M.D., Chief of Division of Anesthesiology and Professor of Anesthesiology

Richard G. Lester, M.D., Professor of Radiology and Chairman of the

Department

Ivan W. Brown, M.D., Director, Blood Bank and Professor of Surgery Ralph E. Thiers, Director, Clinical Chemistry Laboratories, and Professor of Biochemistry

Suydam Osterhout, M.D., Director, Microbiology Laboratories, and As-

sociate Professor of Microbiology

Internships and Residencies

Straight internships of one year duration are available in Medicine, Surgery, Pathology, and Pediatrics, and two mixed internships are offered in Obstetrics and Pediatrics. Appointments are from July 1 through June 30 with few exceptions. Interns receive a stipend of \$240.00 per month, with professional liability insurance, uniforms, and laundry of uniforms provided.

The Residencies offered, with the Chairman or Chief of each service,

are as follows:

Internal Medicine(Chm.)
Dermatology
Neurology
Obstetrics and Gynecology (Chm.)
Ophthalmology(Chm.)
Pathology(Chm.)
Pediatrics (Chm.)
Pediatric Allergy
Pediatric Cardiology
Psychiatry(Chm.)
Radiology(Chm.)
Surgery(Chm.)
Anesthesiology
General Surgery
Neurosurgery

Eugene A. Stead, Jr., M.D.
J. Lamar Callaway, M.D.
Albert Heyman, M.D.
Roy T. Parker, M.D.
Joseph A. C. Wadsworth, M.D.
Thomas D. Kinney, M.D.
Jerome S. Harris, M.D.
Susan C. Dees, M.D.
Madison S. Spach, M.D.
Ewald W. Busse, M.D.
Richard G. Lester, M.D.
David C. Sabiston, Jr., M.D.
Sara J. Dent, M.D.
William W. Shingleton, M.D.
Guy L. Odom, M.D.

Oral Surgery	Nicholas G. Georgiade,
Orthopaedic Surgery	Lenox D. Baker, M.D.
Otolaryngology	William R. Hudson, M.
Plastic Surgery	Kenneth L. Pickrell, M.
Thoracic Surgery	Will C. Sealy, M.D.
Urologic Surgery	James F. Glenn, M.D.

Application forms and information for internships, residences, or fellowships may be obtained by writing to the Chairman of Department, Duke University Medical Center, Durham, North Carolina. Both men and women graduates of any Class A Medical School are eligible for appointment. While internships are rarely available to graduates of medical schools outside the United States and Canada, a limited number of residencies and research fellowships are available from time to time in which case certification by E.C.F.M.G. (Educational Council on Foreign Medical Graduates, 1710 Orrington Avenue, Evanston, Illinois) is prerequisite.

. Georgiade, M.D.

Hudson, M.D. Pickrell, M.D.

Duke University Medical Center is a participating member of the National Intern Matching Program, 2530 North Ridge Avenue, Evanston, Illinois, and all applicants must register with this program. The Hospital is a member of the American Hospital Association, is approved by the American Medical Association for internship and residency training, and is fully approved by the Joint Commission on Accreditation of Hospitals.

As the Duke University Medical Center is an integral part of Duke University, its educational, recreational, and athletic facilities are available for the resident staff.

The Durham Veteran's Administration Hospital adjoins the Duke University Campus, and is operated under the supervision of the Dean's Committee of the Duke University School of Medicine. The full time professional staff of the V.A. Hospital are all members of the School of Medicine faculty. All training programs are integrated with corresponding programs at Duke University Medical Center, which includes rotating of house officers to each hospital from time to time.

Postgraduate Study

Professor W. Nicholson, Assistant Dean, Postgraduate and Continuing Education

Graduates in medicine are welcomed at the various specialty clinics in Medicine, Surgery, Obstetrics, and other specialties from 9:30 A.M. to 12:30 P.M. each morning except Sunday.

Ward rounds are given in Medicine in the mornings as general Out-

Patient Clinics are in session in the afternoon. Throughout the entire year there are concentrated formal types of postgraduate instruction in the way of symposiums and study groups. These include subjects for the generalist as well as for the various specialties. Announcements concerning these symposiums will be made from time to time.



Faculty and Staff

Richard G. Absher, B.S. (Univ. of New Mexico, 1962), Research Associate in Surgery

Trogler Francis Adkins, M.D. (Duke, 1936), Assistant Clinical Professor

of Obstetrics and Gynecology

Sam A. Agnello, A.B. (Duke, 1939), Director of the Division of Audiovisual Education; Coordinator of Medical Television

Marion M. Ahbe, R.T. (Duke, 1965), Technical Instructor

Paul W. Aitken, A.B. (Morris Harvey, 1951), B.D. (Duke, 1955), Th.M. (Duke, 1961), Duke Hospital Chaplain

Irving Alexander, Ph.D. (Princeton, 1949), Professor of Medical Psychology; Professor of Psychology; and Chairman of the Department of Psychology

Pamela Allen, B.A., R.P.T., Assistant in Physical Therapy

John C. Altrocchi, Ph.D. (California, 1957), Associate Professor of Medical Psychology and Assistant Professor of Psychology

Edwin P. Alyea, M.D. (Johns Hopkins, 1923), Professor of Urology and Emeritus Chief of the Division of Urologic Surgery

Joseph M. Amatulli, C.T. (Johns Hopkins, 1959), Instructor in Cytotechnology

Marcelina Amaya, M.D. (Univ. National Autonoma de Mexico, 1954), Associate in Psychiatry

D. Bernard Amos, M.D. (London, 1951), Professor of Immunology and Associate Professor of Experimental Surgery

E. Everett Anderson, M.D. (Duke, 1958), Associate Professor of Urology James W. Anderson, B.B.A. (Miami, 1951), C.P.A. (1955), Business Officer, Duke Hospital

Nels Anderson, Ph.D. (Purdue, 1964), Associate in Physiology

W. Banks Anderson, Jr., M.D. (Harvard, 1956), Assistant Professor of

Ophthalmology

W. Banks Anderson, Sr., M.D. (Johns Hopkins, 1924), Professor Emeritus of Ophthalmology and Emeritus Chief of the Division of Ophthalmology

William B. Anderson, M.D. (Minnesota, 1948), Assistant Professor of Psychiatry

Thomas E. Andreoli, M.D. (Georgetown, 1960), Assistant Professor of

Medicine and Associate in Physiology

William F. Andrews, A. B. (Duke, 1948), Clinical Preceptor in Hospital Administration; Administrator, Memorial Hospital, Wake County

William G. Anlyan, M.D. (Yale, 1949), Professor of Surgery and Dean of the School of Medicine

Jay Morris Arena, M.D. (Duke, 1932), Professor of Pediatrics

Clay M. Armstrong, M.D. (Washington Univ., 1960), Assistant Professor of Medicine and Neurology and Physiology

Tryggvi Asmundsson, M.D. (Iceland, 1964), Instructor in Medicine

Richard A. Atkinson, M.D. (McGill, 1958), Assistant Professor of Anesthesiology

Kurt W. Back, Ph.D. (Massachusetts Inst. of Tech., 1949), Professor of, Medical Sociology and Professor of Sociology

Jorge Baez-Garcia, M.D. (Duke, 1962), Instructor in Medicine

Clarence A. Bailey, Jr., M.D. (North Carolina, 1958), Clinical Instructor in Pediatrics

Barbara Baker, B.S., R.P.T., Assistant Supervisor in Physical Therapy

Lenox D. Baker, M.D. (Duke, 1933), Professor of Orthopaedic Surgery and Chief of the Division of Orthopaedic Surgery.

Marie Baldwin, M.D. (South Carolina, 1929), Assistant Professor of Psychiatry, Staff, Highland Hospital, Asheville, N.C.

John R. Ball, M.S.W. (North Carolina, 1962), Instructor in Psychiatric Social Work

Kathryn Barclay, M.S.W. (Tulane Univ. School of Social Work, 1946), Assistant Professor of Psychiatric Social Work

Sherwood W. Barefoot, M.D. (Duke, 1938), Clinical Associate in Dermatology, Greensboro, N.C.

Joseph E. Barnes, B.S. (Carnegie Tech., 1939), M.B.A. (Chicago, 1947), Clinical Preceptor in Hospital Administration; Director, Rex Hospital, Raleigh, N.C.

William F. Barry, Jr., M.D. (Pennsylvania, 1946), Associate Professor of Radiology and Assistant Professor of Medicine

Frank H. Bassett, III, M.D. (Louisville, 1957), Associate in Anatomy and Assistant Professor of Orthopaedic Surgery

Woodrow W. Batten, M.D. (Bowman Gray, 1944), Clinical Associate in Medicine, Smithfield, N.C.

George J. Baylin, M.D. (Duke, 1937), Professor of Radiology

Dorothy W. Beard, R.N. (Vanderbilt, 1929), Associate in Surgery and Research Associate in Experimental Surgery

Joseph W. Beard, M.D. (Vanderbilt, 1929), James B. Duke Professor of Surgery in Charge of Experimental Surgery and Professor of Virology R. Frederick Becker, Ph.D. (Northwestern, 1940), Associate Professor of Anatomy

Nicole Begin-Heick, Ph.D. (McGill, 1964), Associate in Pharmacology

Victor S. Behar, M.D. (Duke, 1961), Instructor in Medicine

Bernice A. Belue, B.S. (Alabama, 1948), O.T.R. (Washington Univ., 1956), Director of Occupational Therapy

Raymond C. Bender, Ph.D. (Cornell, 1931), Research Associate in

Surgery

Peter J. Bentley, Ph.D. (Univ. of Western Australia, 1960), Associate Professor of Pharmacology

Frederick Bernheim, Ph.D. (Cambridge, 1928), Professor of Pharmacology

Mary L. C. Bernheim, Ph.D. (Cambridge, 1928), Professor of Biochem-

istry

Harold L. Bettis, B.A. (Lenoir Rhyne, 1939), Clinical Preceptor in Hospital Administration; Director, Moses H. Cone Hospital, Greensboro, N.C.

Richard A. Bindewald, A.B. (Furman, 1953), Assistant to the Dean and Instructor in Hospital Administration

Warren P. Bird, B.S. (Georgetown, 1956), M.S. (Columbia, 1964), Chief of Library Systems

Carl M. Bishop, Technical Associate in Pathology

Robert L. Blake, Associate in Medical Art and Illustration J. J. Blum, Ph.D. (Chicago, 1952), Professor of Physiology

Edna Blumenthal, B.S., R.P.T., Associate in Physical Therapy

Morton D. Bogdonoff, M.D. (Cornell, 1948), Professor of Medicine John P. Boineau, M.D. (Duke, 1959), Associate in Medicine and As-

sistant Professor of Pediatrics

Robert A. Bonar, Ph.D. (California, 1953), Associate Professor of Biophysics

Lloyd J. Borstelmann, Ph.D. (California, 1950), Associate Professor of Medical Psychology and Associate Professor of Psychology

Jack Botwinick, Ph.D. (New York, 1953), Professor of Medical Psychology and Lecturer in Psychology

M. Bourgeois-Gavardin, M.D. (Paris, France, 1945; Duke, 1955), Clinical Associate in Anesthesiology

Francis Norman Bowles, M.D. (Med. Coll. of Virginia, 1924), Clinical Instructor in Obstetrics and Gynecology

Saul Boyarsky, M.D. (Vermont, 1946), Assistant Professor of Physiology and Professor of Urology

Delos W. Boyer, M.D. (George Washington, 1950), Clinical Instructor in Orthopaedics, Danville, Va.

William Boyle, Ph.D. (Glasgow Univ., 1963), Instructor in Immunology Robert G. Bradbury, M.D. (South Carolina, 1958), Instructor in Radiology

- William D. Bradford, M.D. (Western Reserve, 1948), Assistant Professor of Pathology
- Teodoro Braganza, M.D. (Univ. of Philippines, 1952), Associate in Psychiatry, Staff, Highland Hospital, Asheville, N.C.
- Ralph W. Brauer, Ph.D. (Univ. of Rochester, 1943), Professor of Physiology
- Sumter C. Brawley, III, B.S. (North Carolina State Univ., 1963),

 Instructor in Electronics
- Bernard Bressler, M.D. (Washington Univ., 1942), Professor of Psychiatry Rubin Bressler, M.D. (Duke, 1957), Professor of Medicine and Endocrinology and Pharmacology; Director, Diabetic Clinic
- J. Street Brewer, M.D. (Jefferson, 1919), Clinical Instructor in General Practice
- R. Carl Britt, M.D. (North Carolina at Chapel Hill, 1961), Instructor in Medicine
- Irwin A. Brody, M.D. (Pennsylvania, 1956), Assistant Professor of Neurology
- Ivan W. Brown, M. D. (Duke, 1940), Director, Blood Bank and Professor of Surgery
- Mary A. Brown, M.A. (L.S.), (Peabody, 1960), Reference Librarian
- Ray E. Brown, M.B.A. (Chicago, 1943), H.H.D. (Wake Forest Coll., 1958), Director of Graduate Program in Hospital Administration and Professor of Hospital Administration
- George W. Brumley, Jr., M.D. (Duke, 1960), Assistant Professor of Pediatrics
- E. C. Bryson, LL.B. (Oregon, 1937), Clinical Lecturer in Hospital Administration; University Attorney; and Professor of Law
- C. Edward Buckley, M.D. (Duke, 1954), Assistant Professor of Medicine Rebecca Hatcher Buckley, M.D. (North Carolina, 1958), Instructor in Pediatrics and Fellow in Immunology
- John Buettner-Janusch, Ph.D. (Michigan, 1957), Associate Professor of Anatomy and Associate Professor of Zoology
- Everett I. Bugg, Jr., M.D. (Johns Hopkins, 1937), Assistant Clinical Professor of Orthopaedics, Durham, N.C.
- Edwin M. Bumgarner, M.T. (Watts Hospital, 1950), Instructor in Medical Technology
- John R. Bumgarner, M.D. (Med. Coll. of Virginia, 1939), Clinical Associate in Medicine, Raleigh, N.C.
- Tiphaine R. Burgess, A.D.A. (Johns Hopkins, 1922), Research Dietitian Peter M. Burkholder, M.D. (Cornell, 1959), Assistant Professor of Pathology
- Joanne Burleigh, B.S., Therapeutic Dietitian

Richard O. Burns, Ph.D. (Illinois, 1962), Assistant Professor of Micro-biology

Robert W. Bush, M.S.W. (Syracuse, 1963), Psychiatric Social Worker,

Staff, Highland Hospital, Asheville, N.C.

Ewald Busse, M.D. (Washington Univ., 1942), J. P. Gibbons Professor of Psychiatry and Chairman of the Department of Psychiatry

William L. Byrne, Ph.D. (Wisconsin, 1953), Associate Professor of Bio-

chemistry

John Cahoon, R.T. (Duke, 1939), F.A.S.X.T., Assistant Professor of Radiologic Technology and Director, School of Radiologic Technology

J. Lamar Callaway, M.D. (Duke, 1932), James P. Duke Professor of

Dermatology

Mary B. Campbell, R.N. (St. Luke's, 1937), Instructor in Anesthesiology and Chief Nurse Anesthetist

Ramon V. Canent, Jr., M.D. (Univ. of Santo Tomas, Philippines, 1957),

Assistant Professor of Pediatrics

Judith Cantey, B.S., R.P.T., Instructor in Physical Therapy

M. Paul Capp, M.D. (North Carolina, 1958), Associate Professor of Radiology

Cecil Carden, Supervisor, Hospital Printing Department

Robert C. Carson, Ph.D. (Northwestern, 1957), Associate Professor of Medical Psychology and Assistant Professor of Psychology

Francis Bayard Carter, M.D. (Johns Hopkins, 1925), Professor of Obstetrics and Gynecology and Chairman Emeritus of the Department

Gordon M. Carver, Jr., M.D. (Duke, 1947), Clinical Instructor in Surgery R. A. Castellanos, D.V.M. (Havana, 1948), Assistant in Veterinary Medicine

G. S. T. Cavanagh, B.A. (Manitoba, 1950), B.L.S. (McGill, 1951), Director of Medical Center Library, Professor of Medical Literature, and Curator of Trent Collection

Patrick J. Cavanaugh, M.D. (St. Louis, 1951), Associate Professor of

Radiology and Chief, Division of Radiation Therapy

Arthur C. Chandler, Jr., M.D. (Duke, 1959), Assistant Professor of Ophthalmology

Gretchen J. Cheek, R.N. (Duke, 1934), Central Supply Services

James T. T. Chen, M.D. (Taipei, Taiwan, 1954), Associate in Radiology Ronald W. Chen, Ph.D. (California, 1957), Assistant Professor of Experimental Surgery; Biochemistry Research Laboratory, V.A. Hospital, Durham, N.C.

Walter Boris Cherny, M.D. (McGill, 1950), Associate Professor of Ob-

stetrics and Gynecology

Glenda K. Cheshire, R.T., (Duke, 1964), Technical Instructor in Radiologic Technology

Arthur Chris Christakos, M.D. (South Carolina, 1955), Assistant Professor of Obstetrics and Gynecology, and Director, Infertility Clinic

C. Donald Christian, Ph.D. (Duke, 1955), M.D. (Duke, 1958), Assistant Professor of Anatomy and Associate Professor of Obstetrics and Gynecology and Endocrinology

Thomas T. Christianberry, R.T. (Akron City Hospital, 1961), Technical

Instructor in Radiologic Technology

Carol H. Church, M.T. (North Carolina at Chapel Hill, 1964), Instructor in Medical Technology

James R. Clapp, M.D. (North Carolina, 1957), Assistant Professor of Medicine

Elon H. Clárk, Coordinator and Professor of Medical Art

Lelia R. Clark, R.N. (Mt. Sinai, 1932), M.A. (Columbia, 1948), Director, Nursing Service and Professor of Nursing

Martha A. Claxton, M.D. (Univ. of Virginia, 1961), Clinical Instructor in

Pediatrics

Martha Clendenin, B.S., R.P.T., Assistant in Physical Therapy

Edward Clifford, Ph.D. (Minnesota, 1957), Assistant Professor of Medical Psychology

Frank W. Clippinger, M.D. (Washington Univ., 1952), Associate Profes-

sor of Orthopaedic Surgery

Clarence H. Cobb, Ph.G. (North Carolina, 1933), Business Manager, Private Diagnostic Clinic, Medical Division and Instructor in Hospital Administration

Isaac Cohen, Ph.D. (Hebrew Univ., Israel, 1966), Research Assistant in

Immunology

Sanford I. Cohen, M.D. (Chicago Medical Coll., 1952), Professor of Psychiatry and Lecturer in Psychology

Norman F. Conant, Ph.D. (Harvard, 1933), James B. Duke Professor of

Microbiology and Chairman of the Department

Charlotte Conely, B.S., Therapeutic and Medical Dietitian

Raphael W. Coonrad, M.D. (Duke, 1947), Clinical Associate in Orthopaedics, Durham, N.C.

A. Derwin Cooper, M.D. (George Washington, 1932), Assistant Clinical Professor of Medicine, Durham, N.C.

Hallie M. Coppedge, M.S.W. (North Carolina at Chapel Hill, 1958), As-

sociate in Psychiatric Social Work
James Coppridge, M.D. (Virginia, 1953), Clicinal Instructor in Urologic

Surgery, Durham, N.C.

Samuel O. Cornwall, M.D. (Minnesota, 1955), Assistant Clinical Professor of Pediatrics

Gail H. Cowan, C.R.N.A., Assistant Nurse Anesthetist

H. William Craig, Technical Associate in Serology

George W. Crane, M.D. (Northwestern, 1946), Clinical Associate in Dermatology, Durham, N.C.

Marion Carlyle Crenshaw, M.D. (Duke, 1956), Assistant Professor of Obstetrics and Gynecology and Associate in Physiology

Roy N. Crenshaw, Business Manager, Surgical Division, Private Diagnostic Clinic

Samuel O. Cornwall, M.D. (Minnesota, 1955), Assistant Professor of Pediatrics

Elaine K. Crovitz, Ph.D. (Duke, 1964), Associate in Medical Psychology and Lecturer in Psychology

Herbert F. Crovitz, Ph.D. (Duke, 1960), Assistant Professor of Medical Psychology and Lecturer in Psychology

Nancy Curtis, B.S., Administrative Dietitian and Instructor in Dietetics

Charles L. Curry, M.D., Clinical Associate in Medicine

W. Kenneth Cuyler, Ph.D. (Duke, 1941), Professor of Obstetrics and Gynecology and Associate Professor of Cytology and Anatomy Bingham Dai, Ph.D. (Chicago, 1935), Professor of Mental Hygiene and

Professor of Psychology

Franklin P. Dalton, M.D. (Duke, 1960), Instructor in Medicine

Leo B. Daniels, Technical Associate in Biochemistry

Eugene A. Davidson, Ph.D. (Columbia, 1955), Professor of Biochemistry James E. Davis, M.D. (Pennsylvania, 1943), Assistant Clinical Professor of Surgery, Durham, N.C.

Wilburt Cornell Davison, M.D. (Johns Hopkins, 1917), James B. Duke

Emeritus Professor of Pediatrics

Diane B. Day, M.S.W. (Tulane Univ. School of Social Work, 1965), Instructor in Psychiatric Social Work

Eugene D. Day, Ph.D. (Delaware, 1952), Professor of Immunology Alfred Dean, Ph.D. (North Carolina, 1965), Associate in Medical Sociology

Hugo L. Deaton, M.D. (Columbia, 1957), Clinical Instructor in Surgery,

Richard Baker Hospital, Hickory, N.C.

John E. Dees, M.D. (Virginia, 1933), Professor of Urology

Susan Coons Dees, M.D. (Johns Hopkins, 1934), Professor of Pediatrics William J. A. DeMaria, M.D. (Duke, 1948), Associate Professor of Pediatrics and Professor of Community Health Sciences

Sara J. Dent, M.D. (Med. Coll. of South Carolina, 1945), Professor of

Anesthesiology and Chief of the Division

Irving Diamond, Ph.D. (Chicago, 1953), Professor of Psychology MacDonald Dick, M.D. (Johns Hopkins, 1928), Associate in Medicine and Assistant Professor of Physiology and Pharmacology

Marcus L. Dillon, M.D. (Duke, 1948), Associate Professor of Surgery and Chief of Thoracic Surgery, V.A. Hospital, Durham, N.C.

William O. Dobbins, M.D. (Alabama, 1957), Assistant Professor of Medicine

George W. Doss, M.D. (Univ. of Texas, Dallas, 1953), Instructor in Psychiatry, Staff, Highland Hospital, Asheville, N.C.

John E. Douglas, M.D. (Johns Hopkins, 1963), Instructor in Medicine

Mary A. Dudley, Ph.D. (Duke, 1965), Research Associate in Micro-biology

Kenneth L. Duke, Ph.D. (Duke, 1940), Associate Professor of Anatomy Marshall C. Dunaway, M.D. (Emory, 1964), Instructor in Medicine

Ray R. Durrett, M.D. (Duke, 1963), Instructor in Medicine

George S. Eadie, M.D. (Toronto, 1921), Ph.D. (Cambridge, 1927), Professor Emeritus of Physiology and Pharmacology

Watt W. Eagle, M.D. (Johns Hopkins, 1925), Professor of Otolaryngology

and Emeritus Chief of the Division of Otolaryngology

Eleanor Beamer Easley, M.D. (Duke, 1944), Associate Clinical Professor of Obstetrics and Gynecology

Frederick T. Eastwood, M.D. (Temple, 1944), Clinical Instructor in

Pediatrics

Paul A. Ebert, M.D. (Ohio State Univ., 1958), Associate Professor of Surgery

Carl Eisdorfer, Ph.D. (New York, 1959), M.D. (Duke, 1964), Associate Professor of Medical Psychology and Lecturer in Psychology

Robert Eisenberg, Ph.D. (University College, London, 1965), Associate in Physiology

Jane G. Elchlepp, M.D. (Chicago, 1955), Ph.D. (Iowa, 1948), Assistant Professor of Pathology and Assistant Dean of Planning

Everett H. Ellinwood, Jr., M.D. (North Carolina at Chapel Hill. 1959), Associate in Psychiatry

George J. Ellis, M.D. (Harvard, 1963), Instructor in Medicine

James L. Elmore, M.D. (Tennessee, 1961), Instructor in Psychiatry and Fellow in Geriatric Psychiatry

Leatrice B. Emory, Supervisor, Electrocardiographic and Basal Metabolic

Laboratory

George A. Engstrom, M.D. (Duke, 1959), Instructor in Pediatrics

Norbert B. Enzer, M.D. (McGill, 1956), Associate in Pediatrics and Assistant Professor of Psychiatry

C. William Erwin, M.D. (Texas, 1960), Associate in Psychiatry Sue Espenshade, B.A., R.P.T., Instructor in Physical Therapy

E. Harvey Estes, M.D. (Emory, 1947), Professor of Community Health Sciences and Chairman of the Department; Professor of Medicine

John W. Everett, Ph.D. (Yale, 1932), Professor of Anatomy

William W. Farley, M.D. (Med. Coll. of Virginia, 1942), Clinical Instructor in Pediatrics

Ben W. Feather, M.D. (George Washington, 1956), Ph.D. (Duke, 1965),

Assistant Professor of Psychiatry and Lecturer in Psychology

Robert E. Fellows, Jr., M.D. (McGill, 1959), Assistant Professor of Physiology and Fellow in Biochemistry and Endocrinology

James R. Felts, Jr., Assistant Executive Director, Hospital and Orphan Sections, The Duke Endowment, and Clinical Instructor in Hospital Administration George B. Ferguson, M.D. (Jefferson, 1932), Assistant Clinical Professor of Endoscopy and Laryngology

Alfred L. Ferguson, M.D. (Tennessee, 1961), Instructor in Medicine Alfredo H. Ferrari, M.D. (Univ. of Buenos Aires, 1954), Assistant Pro-

fessor of Surgery

Bernard F. Fetter, M.D. (Duke, 1944), Associate Professor of Pathology Walter C. Fitzgerald, M.D. (Virginia, 1943), Clinical Associate in Dermatology, Danville, Va.

Eleanor M. Flanagan, M.A. (Duke, 1961), Assistant Professor in Physical

Therapy

John F. Flanagan, M.D. (Duke, 1953), Assistant Professor of Medicine and Microbiology

Walter L. Floyd, M.D. (Johns Hopkins, 1954), Assistant Professor of Medicine

Wiley D. Forbus, M.D. (Johns Hopkins, 1932), Professor Emeritus of Pathology and Chairman Emeritus of the Department of Pathology James R. Fortune, B.S. (North Carolina State, 1935), Instructor in Audi-

ology

D. Robert Fowler, M.D. (Southwestern Med. School, 1961), Instructor in Psychiatry

John A. Fowler, M.D. (Bowman Gray, 1946), Assistant Professor of Pediatrics and Professor of Psychiatry

Terrold W. Fox, M.S.W. (Florida State, 1965), Psychiatric Social Worker, Staff, Highland Hospital, Asheville, N.C.

Charles H. Frenzel, A.B. (Duke, 1941), Administrative Director, Medical Center, and Professor of Hospital Administration

Samuel J. Friedberg, M.D. (Pennsylvania, 1952), Associate Professor of Medicine

Irwin Fridovich, Ph.D. (Duke, 1955), Associate Professor of Biochemistry

Peter William Gage, M.D. (Otago, 1960), Research Associate in Physiology

James C. Gaither, M.D. (Washington Univ., 1961), Instructor in Medicine

Clarence E. Gardner, Jr., M.D. (Johns Hopkins, 1928), Professor of Surgery and Chairman Emeritus of the Department of Surgery

Harry Gardner, Superintendent Building Operations, Duke Hospital

Mary M. Gardner, C.R.N.A., Educational Program Director

M. Linda Garriss, B.S. (North Carolina, 1957), B.S.M.T. (Duke, 1959), M.T. (ASCP), Instructor in Medical Technology

Francis N. Gay, A.B. (North Carolina at Chapel Hill, 1958), Personnel Director, Medical Center

Earl V. Gear, M.D. (New York Med. Coll., 1961), Instructor in Medicine Peter P. Gebel, M.D. (Harvard, 1958), Clinical Associate in Medicine, Durham, N.C.

Illa H. Gehman, Ed.D. (Pennsylvania State, 1947), Associate Professor of Medical Psychology and Lecturer in Psychology

Nicholas G. Georgiade, D.D.S. (Columbia, 1944), M.D. (Duke, 1949),

Professor of Plastic, Maxillofacial, and Oral Surgery

Ruth Georgiade, M.A. (Duke, 1950), Research Associate in Surgery

Carl Gerber, Ph.D. (Washington Univ., 1960), Assistant Professor of Neurology and Associate in Physiology

Daniel T. Gianturco, M.D. (Buffalo, 1960), Associate in Psychiatry

Robert Gibbs, M.D. (Duke, 1959), Assistant Professor of Medicine and Endocrinology

Robert S. Gilgor, M.D. (Pennsylvania, 1962), Instructor in Medicine James P. Gills, Jr., M.D. (Duke, 1959), Associate in Ophthalmology

John Glasson, M.D. (Cornell, 1943), Clinical Associate in Orthopaedics, Durham, N.C.

James F. Glenn, M.D. (Duke, 1953), Professor of Urology and Chief of the Division of Urologic Surgery

Leola A. Glenn, C.R.N.A., Assistant Nurse Anesthetist

Jack K. Goldman, M.D. (Pittsburgh, 1959), Instructor in Medicine

J. Leonard Goldner, M.D. (Nebraska, 1943), Professor of Orthopaedic Surgery

Robert Ö. Gooch, C.P., Assistant Prosthetist and Orthotist

Jack K. Goodrich, M.D. (Tennessee, 1953), Associate Professor of Radiology and Director, Division of Nuclear Medicine

John Ashley Goree, M.D. (Duke, 1955), Associate Professor of Radiology

and Associate in Anatomy

Ralph J. Gorten, M.D. (Pennsylvania, 1955), Assistant Professor of Medicine and Radiology; and Associate in Physiology

Alice JoAnne Graham, A.D.A. (Hines Veteran's Administration Hospital, 1960), Instructor in Dietetics

Lindsay A. Graham, M.D. (McGill, 1955), Assistant Professor of Psychiatry

William Alexander Graham, M.D. (Pennsylvania, 1932), Assistant Clinical Professor of Obstetrics and Gynecology

Cyrus L. Gray, M.D. (Duke, 1937), Clinical Associate in Radiology, High Point, N.C.

Robert L. Green, Jr., M.D. (Hahnemann, 1946), Associate Professor of Psychiatry

Ronald C. Greene, Ph.D. (California Inst. of Tech., 1954), Assistant Professor of Biochemistry and Biochemist, V.A. Hospital, Durham, N.C.

Joseph C. Greenfield, M.D. (Emory, 1956), Associate Professor of Medi-

Donald D. Greenwood, Ph.D. (Harvard, 1960), Assistant Professor of Physiology and Psychology

Robert A. Gregg, M.D. (Med. Coll. of South Carolina, 1948), Associate Professor of Physical Medicine and Coordinator of Rehabilitation

Judith Griffin, B.S., R.P.T., Assistant in Physical Therapy

Clarence E. Grim, M.D. (Missouri, 1963), Instructor in Medicine

Keith S. Grimson, M.D. (Rush Med. Coll., 1933), Professor of Surgery Harvey E. Grode, M.D. (Duke, 1960), Clinical Associate in Medicine,

Harvey E. Grode, M.D. (Duke, 1960), Clinical Associate in Medicine Durham, N.C.

Samson R. Gross, Ph.D. (Columbia, 1953), Professor of Genetics

Walter R. Guild, Ph.D. (Yale, 1951), Professor of Biophysics and Director, Medical Research Training Program

J. Caulie Gunnells, M.D. (South Carolina, 1956), Assistant Professor of Medicine

Jordon U. Gutterman, M.D. (Med. Coll. of Virginia, 1964), Instructor in Medicine

Lorence A. Gutterman, M.D. (Med. Coll. of Virginia, 1964), Instructor in Medicine

Robert L. Habig, Ph.D. (Purdue, 1966), Instructor in Biochemistry

Donald B. Hackel, M.D. (Harvard, 1946), Professor of Pathology

Mary P. Haigler, C.R.N.A., Assistant Nurse Anesthetist

Frank G. Hall, Ph.D. (Wisconsin, 1923), Professor Emeritus of Physiology

Iris B. Hall, Ph.D. (North Carolina at Chapel Hill, 1965), Associate in Radiology

John H. Hall, M.D. (Duke, 1964), Instructor in Medicine

Kenneth D. Hall, M.D. (Duke, 1956), Associate Professor of Anesthesiology

Charles B. Hammond, M.D. (Duke, 1961), Instructor in Obstetrics and Gynecology

Robert E. Hammonds, M.D. (Med. Coll. of Georgia, 1958), Resident and Instructor in Otolaryngology

Judy Hampton, M.A., R.P.T., Instructor in Physical Therapy

Philip Handler, Ph.D. (Illinois, 1939), James B. Duke Professor of Biochemistry and Chairman of the Department of Biochemistry

Oscar C. E. Hansen-Pruss, M.D. (Johns Hopkins, 1924), Professor of Medicine

Elizabeth B. Harkins, M.S.W. (Pittsburgh, 1938), Psychiatric Social Worker, Staff, Highland Hospital, Asheville, N.C.

Alexander Harley, M.B. (St. Mary's, 1960), Instructor in Medicine

James R. Harper, M.D. (North Carolina at Chapel Hill, 1960), *Instructor* in Medicine

Harold J. Harris, M.D. (Long Island Coll. of Med., 1949), Assistant Professor of Pediatrics and Associate Professor of Psychiatry

Jerome S. Harris, M.D. (Harvard, 1933), Professor of Pediatrics; Chairman of the Department of Pediatrics; and Associate Professor of Biochemistry

Lee S. Harris, M.D. (Duke, 1964), Instructor in Medicine

Martha W. Harris, M.T. (ASCP), Instructor in Medical Technology

George P. Harris, A.B. (Duke, 1926), Field Director, Hospital and Orphan Sections, The Duke Endowment, and Clinical Instructor in Hospital Administration

Richard W. Harris, M.S. (L.S.), (North Carolina at Chapel Hill, 1965), Acquisitions Librarian

Claude Harrison, M.S. (North Carolina Coll., 1964), Instructor in Medical Technology

Frederica C. Harrison, M.S.W. (Atlanta Univ., 1962), Instructor in Psychiatric Social Work

H. Courtenay Harrison, M.D. (Duke, 1959), Instructor in Medicine

Deryl Hart, M.D. (Johns Hopkins, 1921), Emeritus Professor of Surgery and President Emeritus of Duke University

Gladys Hart, B.S., R.P.T., Assistant in Physical Therapy

Leonard Hart, Instructor in Medical Photography and Chief of Medical Illustration, V.A. Hospital, Durham, N.C.

Paul W. Hathaway, M.D. (Oklahoma, 1964), Instructor in Medicine

Ralph Hawkins, B.S. (North Carolina, 1957), Assistant Business Manager, Medical Division, Private Diagnostic Clinic

Charles P. Hayes, M.D. (Duke, 1959), Assistant Professor of Medicine Kenneth W. Heaton, M.D. (Middlesex, 1960), Instructor in Medicine Hans M. C. Heick, Ph.D. (Western Ontario, 1964), Instructor in Pediatrics

Peter L. Hein, Jr., M.D. (George Washington, 1955), Assistant Professor of Psychiatry

Ursula I. Heine, Ph.D. (Berlin, Germany, 1953), Research Associate in Experimental Surgery

James P. Hendrix, M.D. (Pennsylvania, 1930), Professor of Medicine Betty Sue Hensley, A.D.A. (Duke, 1966), Medical Dietitian

Paul E. Henson, M.D. (Georgia, 1961), Resident and Instructor in Urologic Surgery

Siegfried Heyden, M.D. (Univ. of Berlin, 1951), Associate Professor of Community Health Sciences

Albert Heyman, M.D. (Maryland, 1940), Professor of Neurology and Chief of the Division of Neurology

Dorothy K. Heyman, M.S.W. (Pennsylvania School of Social Work, 1940), Assistant in Psychiatric Social Work

H. Barrett Heywood, III, M.D. (Emory, 1960), Resident and Instructor in Orthopaedic Surgery

Jacqueline Hijmans, M.D. (State Univ. of Leyden, 1951), Instructor in Physiology and Associate in Medicine

Gale B. Hill, Ph.D. (Duke, 1966), Research Associate in Microbiology Robert L. Hill, Ph.D. (Kansas, 1954), Professor of Biochemistry

Frederick R. Hine, M.D. (Yale, 1949), Associate Professor of Psychiatry

Seth G. Hobart, Jr., M.D. (Duke, 1959), Clinical Instructor in Otolaryngology, Durham, N.C.

Paul Hochstein, Ph.D. (Maryland, 1954), Assistant Professor of Pharma-

cology

Leslie B. Hohman, M.D. (Johns Hopkins, 1917), Professor Emeritus of Psychiatry; Consultant in Psychiatry; and Assistant Professor of Pediatrics (Retired August 30, 1960)

William F. Hollister, M.D. (Duke, 1938), Assistant Clinical Professor of

Surgery, Pinehurst Surgical Clinic, Pinehurst, N.C.

David H. Holloway, M.D. (Tennessee, 1961), Instructor in Medicine Doris Honeycutt, A.D.A. (Duke, 1966), Medical Dietitian

Wendy Honeycutt, B.S., R.P.T., Assistant in Physical Therapy

Robert P. Hornsby, M.D. (Tennessee, 1959), Instructor in Medicine

Paul Horowicz, Ph.D. (Johns Hopkins, 1955), Professor of Physiology Edward S. Horton, M.D. (Harvard, 1957), Associate in Endocrinology Grace C. Horton, B.S., R.P.T., Associate in Physical Therapy and Supervisor of Treatment Division

Raymond L. Howard, Instructor in Medical Photography

Thomas R. Howerton, A.B. (Duke, 1946), Clinical Preceptor in Hospital Administration; Administrator, Wilson Memorial Hospital, Wilson, N.C.

William R. Hudson, M.D. (Bowman Gray, 1951), Professor of Otolaryngology and Chief of the Division of Otolaryngology

Thomas A. Huff, M.D. (Emory, 1961), Instructor in Medicine

Jack Hughes, M.D. (Pennsylvania, 1943), Clinical Instructor in Urology, Durham, N.C.

Noel C. Hunt, M.D. (Vanderbilt, 1961), Instructor in Medicine

Joyace Hunter, B.S. (Tennessee Polytechnic Inst., 1964), Therapeutic Dietitian

Mary M. Huse, Ph.D. (Duke, 1959), Assistant Professor of Medical Psychology and Lecturer in Psychology

Genet Hutcheson, B.S., R.P.T., Assistant in Physical Therapy

William B. Inabnet, M.D. (Louisiana State Univ., 1958), Clinical Instructor in Surgery

Pedro J. Irigaray, M.D. (Mexico, 1955), Clinical Instructor in Psychiatry V. Irons, Research Dietitian

Jacquelyn F. Ivey, C.R.N.A., Assistant Nurse Anesthetist

Ann M. Jacobansky, R.N., M.Ed., (Pittsburgh, 1953), Dean of the School of Nursing

Boi Jon Jaeger, M.H.A. (Duke, 1964), Director of Duke Hospital Outpatient and Extension Services

Frances C. Jeffers, M.A. (Columbia, 1945), Research Associate in Psychiatry

Patricia Swogger Jennings, B.S. (Michigan State, 1955), Teaching Dietitian

Ralph E. Jennings, B.A., B.S. (East Tennessee State, 1954), Assistant Administrative Director and Instructor in Hospital Administration

John P. Jimenez, M.D. (Med. Coll. of Virginia, 1955), Associate in Radiology

Frans F. Jobsis, Ph.D. (Michigan, 1958), Associate Professor of Physiol-

Amos N. Johnson, M.D. (Pennsylvania, 1933), Clinical Instructor in General Practice

Charles Johnson, M.D. (Howard, 1963), Instructor in Medicine

Edward A. Johnson, M.B., Ch.B. (Univ. of Sheffield, 1950), M.D. (Univ. of Sheffield, 1953), Associate Professor in Pharmacology

Irwin Johnsrude, M.D. (Manitoba, 1956), Assistant Professor of Radi-

ology

Rachel R. Johnson, C.R.N.A., Assistant Nurse Anesthetist

William W. Johnston, M.D. (Duke, 1959), Assistant Professor of Pathology and Director, School of Cytotechnology

Claudius Parks Jones, M.D. (Duke, 1954), Associate in Pediatrics; Assistant Professor of Psychiatry; and Research Associate in Obstetrics and Gynecology

James David Jones, M.D. (Duke, 1954), Associate in Pediatrics and As-

sistant Professor of Psychiatry

O. William Jones, M.D. (Oklahoma, 1957), Assistant Professor of Medicine

Thomas T. Jones, M.D. (Johns Hopkins, 1932), Clinical Instructor in General Practice and Clinical Associate in Medicine, Durham, N.C.

Jayant G. Joshi, Ph.D. (Univ. of Poona, India, 1957), Associate in Biochemistry

William Jurgelsky, Jr., Ph.D. (Rutgers, 1958), Research Associate in Pathology

Varda Kahn, Ph.D. (Illinois, 1959), Research Associate in Physiology Helen L. Kaiser, R.P.T. (Harvard, 1921), Director and Associate Professor of Physical Therapy

Henry Kamin, Ph.D. (Duke, 1948), Professor of Biochemistry and

Principal Scientist at the V.A. Hospital, Durham, N.C.

Shankar N. Kapoor, M.D. (King George's Med. Coll., Lucknow, India, 1935), Clinical Associate in Orthopaedics, Durham, N.C.

Poly G. Karcz, A.B. (Meredith, 1950), Assistant Librarian

Louise Kaufman, A.B. (North Carolina, 1947), Research Associate in Obstetrics and Gynecology

Nathan Kaufman, M.D. (McGill, 1941), Professor of Pathology

Charles R. Keith, M.D. (Kansas Univ., 1957), Assistant Professor of Psychiatry

Walter Kempner, M.D. (Heidelberg, 1927), Professor of Medicine

Patrick Kenan, M.D. (Duke, 1959), Assistant Professor of Otolaryngology Grace P. Kerby, M.D. (Duke, 1936), Professor of Medicine

Betty W. Kernodle, R.R.L., A.B. (Duke, 1940), Director, Medical Record Department

Thomas C. Kerns, Jr., M.D. (Duke, 1950), Clinical Assistant in Ophthal-

mology

Roby M. Kerr, M.S.W. (Tulane Univ. School of Social Work, 1962), Instructor in Psychiatric Social Work

Kaye H. Kilburn, M.D. (Utah, 1954), Associate Professor of Medicine and Chief, Medical Service, V.A. Hospital, Durham, N.C.

Seuk Ky Kim, M.D. (Severance Med. Coll., Seoul, Korea, 1950), Assistant Professor of Radiology

Kwang Soo Kim, M.D. (Severence, Korea, 1957), Instructor in Radiology

Burton B. King, M.D. (Northwestern, 1955), Associate in Otolaryn-gology

Glendall L. King, M.D. (Washington Univ., 1955), Clinical Lecturer in

Surgery

Thomas D. Kinney, M.D. (Duke, 1937), Professor of Pathology and Chairman of the Department of Pathology

Marcel Kinsbourne, B.M. (Guy's Hospital, London, 1955), Associate Professor of Pediatrics and Assistant Professor of Neurology

John M. Kioschos, M.D. (Heidelberg, 1959), Instructor in Medicine

Norman Kirshner, Ph.D. (Pennsylvania State, 1952), Associate Professor of Biochemistry and Experimental Surgery and U.S.P.H.S. Senior Research Fellow

Robert F. Klein, M.D. (Alabama, 1955), Assistant Professor of Medicine Gordon K. Klintworth, M.D., Ph.D. (Univ. of Witwatersrand, 1957, 1966), Assistant Professor of Pathology and Research Associate in Ophthalmology

Conrad M. Knight, B.S. (Norwich Univ., 1953), Radiological Safety Of-

ficer and Associate in Community Health Sciences

Yihoug Kong, M.D. (Taiwan, 1958), Instructor in Medicine

Jack L. Kostyo, Ph.D. (Cornell, 1957), Professor of Physiology and Endocrinology

Helen T. Kotin, M.D. (Univ. of Colorado, 1938), Assistant Dean of Research

John C. Kouns, D.D.S. (Emory, 1937), Clinical Associate in Dentistry and Chief of Dental Service, V.A. Hospital, Durham, N.C.

George E. Koury, M.D. (Tulane, 1944), Clinical Associate in Medicine, Burlington, N.C.

Irwin Kremen, Ph.D. (Harvard, 1961), Associate Professor of Medical Psychology and Assistant Professor of Psychology

William B. Kremer, M.D. (State Univ. New York, 1960), Instructor in Medicine

Curtis J. Krock, M.D. (Johns Hopkins, 1961), Instructor in Medicine

Arnold D. Krugman, Ph.D. (Kentucky, 1952), Assistant Professor of Medical Psychology

Johannes A. Kylstra, M.D. (Leiden, 1952), Assistant Professor of Medicine

and Physiology

Maurine B. LaBarre, M.S.W. (Bryn Mawr, 1934), Assistant Professor of Psychiatric Social Work

Weston LaBarre, Ph.D. (Yale, 1937), Consultant in Psychiatry and Professor of Anthropology

Peregrina C. Labay, M.D. (Univ. of St. Thomas, 1954), Research As-

sociate in Urologic Surgery

Leon Lack, Ph.D. (Columbia, 1953), Assistant Professor of Pharmacology Martin Lakin, Ph.D. (Chicago, 1955), Associate Professor of Medical Psychology and Associate Professor of Psychology

Alphonse J. Langlois, Ph.D. (Duke, 1966), Research Associate in Sur-

gery

John E. Larsh, Jr., ScD. (Johns Hopkins, 1943), Professor of Parasitology, Duke University and the University of North Carolina

John Laszlo, M.D. (Harvard, 1955), Associate Professor of Medicine

Patrica Lawrence, R.N., M.A. (Columbia Teachers College, 1960), Assistant Professor of Nursing

Glenn A. Lazenby, D.D.S. (Med. Coll. of Virginia, 1946), Clinical

Instructor in Oral Surgery

Harold E. Lebovitz, M.D. (Pittsburgh, 1956), Associate Professor of Medicine and Director of Endocrinology

Chien Ping Lee, Ph.D. (Duke, 1964), Associate in Physiology

John C. LeMay, D.V.M. (Georgia, 1959), Associate Professor of Veterinary Medicine and Chairman of the Department

Norma Lester, B.A. (Lees McRae, 1954), M.T. (ASCP), Instructor in

Medical Technology

Richard G. Lester, M.D. (Columbia, 1948), Professor of Radiology and Chairman of the Department

Donald S. Leventhal, Ph.D. (Purdue, 1965), Associate in Medical Psychology

Miriam L. Leventhal, M.S.W. (Hunter Coll. of City Univ. of N.Y. School of Social Work, 1963), Instructor in Psychiatric Social Work

Carole Levinson, M.CD. (Univ. of Oklahoma, 1966), Instructor in Surgery

Marie A. Linder, Ph.D. (Duke, 1966), Instructor in Medical Psychology Herman P. Lineberger, M.D. (North Carolina at Chapel Hill, 1954), Associate in Psychiatry

Charles E. Llewellyn, Jr., M.D. (Med. Coll. of Virginia, 1946), Associate

Professor of Psychiatry

E. A. Cecil Lloyd, M.D. (London, England, 1951), Clinical Associate in Anesthesiology and Chief of Anesthesiology, V.A. Hospital, Durham, N.C.

David A. Lockhart, M.D. (Duke, 1951), Clinical Instructor in Pediatrics Mary Jane Lockhart, A.B., R.T., (Duke, 1958), Technical Instructor in Radiologic Technology

Arthur Hill London, M.D. (Pennsylvania, 1927), Assistant Clinical Professor of Pediatrics, Duke, and Clinical Professor of Pediatrics, Univer-

sity of North Carolina

William L. London, M.D. (North Carolina at Chapel Hill, 1955), Clinical Instructor in Pediatrics

E. Croft Long, M.B., B.S., Ph.D. (London, 1952, 1957), Associate in Pediatrics; Associate Professor of Physiology; Professor of Community Health Sciences; and Assistant Dean, Medical Student Affairs

Thomas D. Long, M.D. (Bowman Gray, 1952), Clinical Associate in

Medicine, Roxboro, N.C.

Hans Lowenbach, M.D. (Hamburg, 1929), Assistant Professor of Pediatrics and Professor of Psychiatry

Zolton John Lucas, M.D. (Johns Hopkins, 1957), Assistant Professor of Surgery

Emmett S. Lupton, M.D. (New York, 1938), Clinical Associate in Dermatology, Greensboro, N.C.

John A. Lusk, M.D. (Alabama, 1951), Clinical Associate in Medicine, Greensboro, N.C.

William S. Lynn, M.D. (Columbia, 1946), Associate Professor of Biochemistry and Professor of Medicine and Endocrinology

George M. Lyon, Jr., M.D. (Duke, 1961), Assistant Professor of Pediat-

Ted A. Maag, D.V.M. (Georgia, 1962), Research Associate in Surgery George L. Maddox, Jr., Ph.D. (Michigan State, 1956), Professor of Medical Sociology and Professor of Sociology

M. Stephen Mahaley, M.D. (Duke, 1959), Assistant Professor of Neuro-

surgery and Anatomy

James D. Mallory, Jr., M.D. (Duke, 1958), Instructor in Psychiatry

Charles M. Mansbach, M.D. (New York, 1963), Instructor in Medicine Joseph E. Markee, Ph.D. (Chicago, 1929), James B. Duke Professor of Anatomy and Assistant Dean of Admissions (On sabbatical leave July 1, 1966, through June 30, 1967)

Lockert B. Mason, M.D. (Med. Coll. of Virginia, 1945), Assistant Clinical

Professor of Surgery, Wilmington, N.C.

Raymond Massengill, Jr., M.S. (Tennessee, 1959), Associate in Medical Speech Pathology

Charles U. Mauney, Ph.D. (North Carolina at Chapel Hill, 1966), Associate in Pathology

F. Maxton Mauney, Jr., M.D. (Duke, 1959), Instructor in Surgery

Demmie C. Mayfield, M.D. (Univ. of Texas Med. Br., 1958), Assistant Professor of Psychiatry

H. D. Maynard, M.A. (North Carolina at Chapel Hill, 1947), Assistant Business Manager, Surgical Division, Private Diagnostic Clinic

Angus M. McBryde, M.D. (Pennsylvania, 1927), Professor of Pediatrics B. G. McCall, B.S. (Clemson, 1950), Director, Management Service, Hospital and Orphan Sections, The Duke Endowment, and Clinical Instructor in Hospital Administration

Ann M. McCallum, B.S., R.P.T., Secretary-Recorder for the Curriculum in

Physical Therapy

Kenneth S. McCarty, Ph.D. (Columbia, 1957), Associate Professor of Biochemistry

Richard V. McCloskey, M.D. (Rochester, 1960), Assistant Professor of Medicine and Instructor in Immunology

Donald E. McCollum, M.D. (Bowman Gray, 1953), Assistant Professor of Orthopaedic Surgery

Alice McCrea, M.S. (Chicago, 1958), Assistant Professor of Radiology in Radiation Physics

Constance McDaniel, M.S. (Drexel Inst. of Technology, 1952), Chief Cataloguer

Huey G. McDaniel, M.D. (Alabama, 1963), Instructor in Medicine

Frederick D. McFalls, M.D. (Duke, 1949), Assistant Professor of Anatomy Henry D. McIntosh, M.D. (Pennsylvania, 1950), Professor of Medicine

John C. McKinney, Ph.D. (Michigan State, 1953), Professor of Medical Sociology; Professor of Sociology; and Chairman of the Department of Sociology

Mary Helen McLachlan, M.A., Educational Director and Associate

Professor of Dietetics

Thomas J. McManus, M.D. (Boston University, 1955), Assistant Professor of Physiology

Robert McMasters, M.D. (Texas, 1958), Associate in Neurology and Anatomy

William O. McMillan, M.D. (Duke, 1963), Instructor in Medicine

Harry T. McPherson, M.D. (Duke, 1948), Associate Professor of Medicine and Director, Endocrine Clinic

Samuel D. McPherson, M.D. (Johns Hopkins, 1943), Clinical Associate in Ophthalmology 1997

Elijah E. Menefee, Jr., M.D. (Duke, 1936), Professor of Medicine

Richard S. Metzgar, Ph.D. (Buffalo, 1959), Associate Professor of Immunology

Leslie C. Meyer, M.D. (Nebraska, 1943), Clinical Lecturer in Orthopaedics; Orthopaedic Surgeon, Shriners' Hospital for Crippled Children, Greenville, S.C.

D. Edmond Miller, M.D. (Duke, 1956), Clinical Associate in Cardiology, Durham, N.C.

George R. Miller, M.D. (Rochester, 1943), Clinical Lecturer in Ortho-

paedics; Associate Surgeon, N.C. Orthopaedic Hospital, Gastonia, N.C.

James A. Miller, R.T. (Iowa, 1959), Assistant Technical Director in Radiology

Oscar L. Miller, M.D. (Emory, 1921), Clinical Lecturer in Orthopaedics; Orthopaedic Surgeon, Charlotte Memorial Hospital, Charlotte, N.C.

William S. Miller, M.D. (North Carolina at Chapel Hill, 1961), Instructor in Medicine

Ava Ball Moody, C.R.N.A. (Duke School of Anesthesia, 1961), Assistant Nurse Anesthetist

Virginia Hartwell Moody, R.T. (North Carolina Memorial Hospital), Technical Instructor

Donald T. Moore, M.D. (Meharry, 1958), Instructor in Obstetrics and Gynecology

John A. Moore, M.D. (Med. Coll. of Virginia, 1948), Clinical Associate in Medicine, Greensboro, N.C.

John W. Moore, Ph.D. (Virginia, 1945), Professor of Physiology

James J. Morris, M.D. (State Univ. of New York, 1959), Associate in Medicine

Donald M. Monson, M.D. (Wisconsin, 1955), Clinical Associate in Radiology; Watts Hospital, Durham, N.C.

M. Vernon Morgan, B.S. (North Carolina State Univ., 1958), Instructor in Anatomy

Nelle S. Moseley, M.D. (Med. Coll. of Georgia, 1957), Clinical Instructor in Pediatrics

Montrose J. Moses, Ph.D. (Columbia, 1949), Professor of Anatomy

John F. Moulton, M.S. (Columbia, 1947), Clinical Preceptor in Hospital Administration; Director, Watts Hospital, Durham, N.C.

Daniel F. Murphy, Ph.D. (Rochester, 1965), Associate in Medical Psychology

Virginia Murphy, B.S., Administrative Dietitian

Robert E. Musgrave, M.D. (Tennessee, 1946), Clinical Instructor in Orthopaedics, Danville, Va.

A. Wendell Musser, M.D. (Indiana, 1956), Associate Professor of Pathology and Chief of Laboratory Services, V.A. Hospital, Durham, N.C.

Marc J. Musser, M.D. (Univ. of Wisconsin, 1934), Professor of Medicine Allen A. Nadler, M.D. (Western Reserve, 1962), Instructor in Medicine Toshio Narahashi, B.S., Ph.D. (Tokyo, 1948, 1960), Assistant Professor of Physiology

Blaine S. Nashold, M.D. (McGill, 1954), Associate Professor of Neuro-

surgern

Dorothy Naumann, M.D. (Syracuse, 1940), Associate in Community Health Sciences and Associate Director of Student Health, Woman's Division

- Charles B. Neal, III, M.D. (Duke, 1955), Clinical Instructor in Pediatrics
- Bohdan R. Nechay, D.V.M. (Univ. of Minnesota, 1953), Assistant Professor of Surgery and Pharmacology
- Stanley S. Needell, M.D. (Virginia, 1956), Assistant Professor of Psychiatry
- Barbara C. Newborg, M.D. (Johns Hopkins, 1949), Associate in Medicine William M. Nicholson, M.D. (Johns Hopkins, 1931), Professor of Medicine and Endocrinology and Assistant Dean, Postgraduate and Continuing Education
- H. Stewart Nielsen, Jr., Ph.D. (Ohio State, 1964), Instructor in Micro-biology
- Nancy Nolan, M.S. (Ohio State Univ., 1964), Assistant Professor of Nursing
- Charles W. Norville, Jr., M.D. (Vanderbilt, 1956), Assistant Professor of Psychiatry, Staff, Highland Hospital, Asheville, N.C.
- Yasuhiko Nozaki, Ph.D. (Tokyo, 1945), Associate in Biochemistry
- Walter D. Obrist, Ph.D. (Northwestern, 1950), Professor of Medical Psychology and Lecturer in Psychology
- Guy L. Odom, M.D. (Tulane, 1933), Professor of Neurosurgery and Chairman, Division of Neurosurgery
- Dorothea Oestreich, M.S.W. (Wisconsin, 1949), Psychiatric Social Worker, Staff, Highland Hospital, Asheville, N.C.
- William M. O'Fallon, Ph.D. (North Carolina, 1965), Assistant Professor of Community Health Sciences, Biostatistics Unit
- Mary Scarborough Olive, B.A. (Salem College, 1962), Projects Dietitian Edward S. Orgain, M.D. (Virginia, 1930), Professor of Medicine
- Shirley Kirkman Osterhout, M.D. (Duke, 1957), Associate in Pediatrics Suydam Osterhout, M.D. (Duke, 1950), Ph.D. (Rockefeller Inst., 1959),
- Director, Microbiology Laboratories; Associate Professor of Microbiology; Assistant Professor of Medicine; and Assistant Dean, Admissions
- Athos Ottolenghi, M.D. (Pavia, Italy, 1946), Associate Professor of Pharmacology
- George M. Padilla, Ph.D. (California, 1960), Assistant Professor of Physiology
- Sidney S. Paine, Administrator in the Department of Radiology
- Carolyn Palmer, A.B., R.P.T., Assistant in Physical Therapy.
- Leonard Palumbo, M.D. (Duke, 1944), Clinical Lecturer in Obstetrics and Gynecology
- Roy T. Parker, M.D. (Med. Coll. of Virginia, 1944), Professor and Chairman of Obstetrics and Gynecology and Professor of Endocrinology Edward T. Parrish, Manager, Hospital Laundry

Idell Parrish, B.S., R.P.T., Coordinator for Extension Services in Physical Therapy

Mary Lou Pate, B.S., Assistant Director and Instructor of Dietetics

Simmons Isler Patrick, M.D. (Duke, 1951), Clinical Associate in Radiology, Kinston, N.C.

Carl Patterson, M.D. (Maryland, 1944), Assistant Clinical Professor of

Otolaryngology, Durham, N.C.

Zdenek D. Pauk, M.D. (State Univ. of Iowa, 1956), Associate in Psychiatry

Phillip H. Pearce, M.D. (Duke, 1961), Instructor in Obstetrics and Gunecology

Richard Lehmer Pearse, M.D. (Harvard, 1931), Associate Clinical Professor of Obstetrics and Gynecology

Talmage L. Peele, M.D. (Duke, 1934), Professor of Anatomy; Associate Professor of Neurology; and Assistant Professor of Pediatrics

Charles H. Peete, Jr., M.D. (Harvard, 1947), Associate Professor of Obstetrics and Gynecology and Endocrinology

William P. J. Peete, M.D. (Harvard, 1947), Associate Professor of Surgery Henry T. Perkins, M.D. (Duke, 1957), Clinical Associate in Medicine, Raleigh, N.C.

Frances R. Perry, C.R.N.A., Assistant Nurse Anesthetist

Elbert L. Persons, M.D. (Harvard, 1927), Director of Student Health; Professor of Medicine; and Associate Professor of Community Health Sciences

Ernst Peschel, M.D. (Berlin, 1930), Associate Professor of Medicine

Carol Sue Peters, A.D.A. (Duke, 1966), Medical Dietitian

Madge A. Pfaffman, Ph.D. (Univ. of Mississippi, 1965), Research Associate in Physiology

Eric A. Pfeisfer, M.D. (Washington Univ., 1960), Assistant Professor of Psychiatry

John B. Pfeiffer, M.D. (Cornell, 1942), Associate Professor of Neurology Natasha M. Pfeiffer, M.S.W. (Smith Coll., 1963), Instructor in Psychiatric Social Work

Marshall I. Pickens, M.A. (Duke, 1926), Executive Director, Hospital and Orphan Sections, The Duke Endowment, and Clinical Associate in Hospital Administration

Henry F. Pickett, Associate in Medical Photography

J. Phillip Pickett, H.T. (ASCP), Instructor in Medical Technology and

Technical Associate in Pathology

Kenneth L. Pickrell, M.D. (Johns Hopkins, 1935), Professor of Plastic and Maxillofacial Surgery and Chief of the Division of Plastic and Maxillofacial Surgery

Kenneth Arthur Podger, M.D. (Duke, 1941), Assistant Clinical Professor

of Obstetrics and Gynecology

- Barbara A. Pope, M.S.S.W. (Richmond Prof., 1953), Associate in Psychiatric Social Work
- Thaddeus H. Pope, Jr., M.D. (North Carolina at Chapel Hill, 1957), Clinical Associate in Surgery
- Erice Porter, R.T. (Duke, 1961), ASRT, Technical Instructor in Radiologic Technology
- F. Stanley Porter, M.D. (Johns Hopkins, 1952), Associate Professor of Pediatrics
- Richard M. Portwood, M.D. (Southwestern, 1954), Assistant to the Director of Student Health; Assistant Professor of Medicine; and Assistant Professor of Community Health Sciences
- Raymond W. Postlethwait, M.D. (Duke, 1937), Professor of Surgery and Chief of Staff, V.A. Hospital, Durham, N.C.
- Albert H. Powell, Jr., M.D. (Duke, 1957), Associate in Psychiatry
- Gerald F. Powell, Ph.D. (Marquette Univ. of Western Ontario, 1964),

 Instructor in Pediatrics
- Phillip C. Pratt, M.D. (Johns Hopkins, 1944), Associate Professor of Pathology
- Jack J. Preiss, Ph.D. (Michigan State, 1954), Associate Professor of Medical Sociology and Associate Professor of Sociology
- Ardell Proctor, M.S. (Minnesota, 1950), M.T. (ASCP) Instructor in Microbiology and Instructor in Medical Technology
- Jack H. Prost, Ph.D. (Chicago, 1961), Assistant Professor of Anatomy and Sociology-Anthropology
- J. Minetree Pyne, B.S. (North Carolina, 1940), Clinical Preceptor in Hospital Administration; Administrator, Memorial Hospital of Alamance County, Burlington, N.C.
- Galen W. Quinn, D.D.S. (Creighton, 1952), M.S. (Tennessee, 1955), Professor of Orthodontics
- Betsy Woodhall Rackley, R.N.B.S. (Duke, 1963), Instructor in Nursing Procedures
- Milton Raben, M.D. (Tufts, 1959), Assistant Professor of Radiology
- Judith Rae, B.S., R.P.T., Assistant in Physical Therapy
- K. V. Rajagopalan, Ph.D. (Madras, 1957), Assistant Professor of Biochemistry
- P. Ramschender Rao, Ph.D. (Tennessee, 1963), Research Associate in Experimental Surgery
- Percy H. Ray, C.O., Assistant Orthotist
- I. Thomas Reamer, Ph.G. (Maryland, 1924), Pharmacist and Associate in Pharmacy
- John B. Reckless, M.B., Ch.B. (Univ. of Birmingham, England, 1954), Assistant Professor of Psychiatry
- William C. Redmond, M.S. (Illinois, 1962), Instructor in Anatomy
- Marilyn D. Reedy, M.S.W. (Tulane Univ. School of Social Work, 1964),

 Instructor in Psychiatric Social Work

Eva O. Reese, R.N. (Duke, 1955), Instructor in Perimetry

Robert J. Reeves, M.D. (Baylor, 1924), Professor of Radiology

A. William Renuart, M.D. (Duke, 1956), Assistant Professor of Pediatrics

Barbara Z. Renkin, Ph.D. (Johns Hopkins, 1959), Associate in Physiology

Eugene M. Renkin, Ph.D. (Harvard, 1951), Professor of Pharmacology and Head of the Division of Pharmacology

John M. Rhoads, M.D. (Temple, 1943), Professor of Psychiatry

A. Douglas Rice, M.D. (Duke, 1951), Clinical Instructor in Pediatrics Reed P. Rice, M.D. (Indiana, 1955), and M.S. (Minnesota, 1961), As-

sistant Professor of Radiology
Doris M. Rickel, M.S.W. (Univ. of Pennsylvania, 1937), Associate in
Psychiatric Social Work

John Riebel, B.D., M.A., R.P.T., Associate in Physical Therapy

Jack G. Robbins, M.D. (Duke, 1948), Clinical Associate in Dermatology Louis C. Roberts, M.D. (Duke, 1934), Clinical Instructor in Urologic Surgery, Durham, N.C.

William McK. Roberts, M.D. (Tufts, 1925), Clinical Lecturer in Orthopaedics; Surgeon-in-Chief, N.C. Orthopaedic Hospital, Gastonia, N.C.

J. David Robertson, Ph.D. (M.I.T., 1952), M.D. (Harvard, 1945), Professor of Anatomy and Chairman of the Department

Roscoe R. Robinson, M.D. (Oklahoma, 1954), Associate Professor of Medicine

Wilson Rocha, M.D. (Univ. of Minas Gerais, Brazil, 1953), Instructor in Pediatrics

Eleanor Rodwell, M.D. (Temple, 1942), Clinical Instructor in Obstetrics and Gynecology

Christa Von Roebel, M.D. (Leipzig, 1937), Associate in Obstetrics and Gynecology

Lon E. Rogers, M.D. (Univ. of Texas, 1959), Instructor in Pediatrics Donald W. Romhilt, M.D. (Duke, 1962), Instructor in Medicine

Theodore Rosett, Ph.D. (London, 1955), Associate in Biochemistry

Norman F. Ross, D.D.S. (Temple, 1937), Associate Professor of Dentistry and Chief of the Division of Dentistry

Robert Alexander Ross, M.D. (Pennsylvania, 1922), Clinical Lecturer in Obstetrics and Gynecology

Wendell Rosse, M.D. (Chicago, 1958), Assistant Professor of Medicine David T. Rowlands, Jr., M.D. (Univ. of Pennsylvania, 1955), Associate Professor of Pathology

H. Carl Rowland, B.S. (Davison, 1942), Director, Planning and Design Service, Hospital and Orphan Sections, The Duke Endowment, and Clinical Instructor in Hospital Administration

Julian M. Ruffin, M.D. (Virginia, 1926), Professor of Medicine

Mary Alice Rundles, A.B. (DePauw, 1935), Instructor in Anatomy R. Wayne Rundles, M.D. (Duke, 1940), Professor of Medicine

Carol Rusian, B.S., Therapeutic Dietitian

Jerome Ruskin, M.D. (Albert Einstein, 1960), Instructor in Medicine

David C. Sabiston, Jr., M.D. (Johns Hopkins, 1947), Professor of Surgery and Chairman of the Department of Surgery

Anne E. Sagberg, M.D. (Oslo, 1947), Associate in Psychiatry, Staff, High-

land Hospital, Asheville, N.C.

Harvey J. Sage, Ph.D. (Yale, 1958), Assistant Professor of Pathology and Assistant Professor of Biochemistry

Aaron P. Sanders, M.S., Ph.D. (North Carolina, 1964), Associate Professor of Radiology and Director, Division of Radiobiology

Herbert A. Saltzman, M.D. (Jefferson, 1952), Associate Professor of Medi-

John Salzano, Ph.D. (Iowa, 1956), Associate Professor of Physiology

Baxter B. Sapp, D.D.S. (Temple, 1951), Associate in Dentistry

H. Max Schiebel, M.D. (Johns Hopkins, 1933), Clinical Associate in Surgery, Durham, N.C.

Stephen F. Schaal, M.D. (Ohio State, 1964), Instructor in Medicine Saul M. Schanberg, M.D. (Yale, 1964), Assistant Professor in Neurology

Guy W. Schlaseman, M.D. (Duke, 1946), Assistant Clinical Professor of Radiology, Watts Hospital, Durham, N.C.

William C. Schmidt, B.S., R.P.T., Assistant in Physical Therapy Roberto E. Schneider, M.D. (San Carlos, 1960), Instructor in Medicine Kenneth J. Schoonhagen, M.H.A. (Duke, 1964), Administrative Assistant Fred W. Schoonmaker, M.D. (Colorado, 1961), Assistant Professor of Medicine

Nathan Schupper, D.D.S. (Pittsburgh, 1932), Clinical Associate in Dentistry and Assistant Chief of Dental Service, V.A. Hospital, Durham, N.C.

Suzanne Schrack, B.S.M.T. (Duke, 1958), M.T. (ASCP), Instructor in Medical Technology

Martha J. Scoggins, Executive Housekeeper

Will C. Sealy, M.D. (Emory, 1936), Professor of Thoracic Surgery and Chief of the Division of Thoracic Surgery

Robert W. Seaton, M.D. (Univ. of Tennessee, 1960), Instructor in

Obstetrics and Gynecology

H. F. Seigler, M.D. (North Carolina, 1960), Research Associate in Immunology

Donald E. Seim, M.D. (Med. Coll. of Virginia, 1961), Associate in Radi-

James H. Semans, M.D. (Johns Hopkins, 1936), Professor of Urology Kathryn W. Sharpe, A.B. (Duke, 1960), Instructor in Radiology

Dorothy B. Shearin, M.D. (Woman's Med. Coll. of Pennsylvania, 1954), Clinical Associate in Pediatrics

- Bagher Sheikholislam, M.D. (Univ. of Teheran, Iran, 1958), Research Associate in Pediatrics
- John F. Sherrill, Jr., M.D. (Bowman Gray, 1945), Assistant Clinical Professor of Radiology; Chief, Radiology, Watts Hospital, Durham, N.C.

B. F. Sherwood, D.V.M. (Georgia, 1959), Associate in Veterinary Medicine

William W. Shingleton, M.D. (Bowman Gray, 1943), Professor of Surgery; Chief of the Division of General Surgery; and Chairman, Undergraduate Cancer Training Program

Barry M. Shmavonian, Ph.D. (Washington, 1957), Associate Professor of Medical Psychology and Lecturer in Psychology

Marvin J. Short, II, M.D. (Duke, 1962), Instructor in Psychiatry

James B. Sidbury, Jr., M.D. (Columbia, 1947), Professor of Pediatrics;
Director of Clinical Research Unit; and Professor of Endocrinology

Herbert O. Sieker, M.D. (Washington Univ., 1948), Professor of Medicine and Assistant Dean, Coordination of Educational Affairs.

Harold R. Silberman, M.D. (Washington Univ., 1956), Assistant Professor of Medicine

Donald Silver, M.D. (Duke, 1955), Associate Professor of Surgery

George A. Silver, M.D. (Duke, 1938), Associate Professor of Psychiatry William V. Singletary, M.D. (Duke, 1943), Clinical Associate in Medicine, Durham, N.C.

Benjamin S. Skinner, M.D. (Washington, 1940), Clinical Instructor in Pediatrics

Albert G. Smith, M.D. (Washington Univ., 1947), Associate Professor of Pathology

Allen D. Smith, M.D. (Georgia, 1937), Clinical Associate in Dermatology, Durham, N.C.

David T. Smith, M.D. (Johns Hopkins, 1922), Professor of Community Health Sciences; Associate Professor of Medicine; and James B. Duke Professor of Microbiology

Donald S. Smith, II, M.H.A. (Minnesota, 1953), Program Coordinator and Assistant Professor of Hospital Administration

J. Graham Smith, M.D. (Duke, 1950), Professor of Dermatology

Preston W. Smith, Supervisor, Private Medical Laboratory; Instructor in Medical Technology; and Technical Associate in Clinical Microscopy

Wirt Smith, M.D. (Texas, 1951), Associate Professor of Experimental Surgery

Ralph E. Snider, D.D.S. (Ohio State, 1948), Associate in Dentistry and Staff Dentist of Dental Service, V.A. Hospital, Durham, N.C.

George G. Somjen, M.D. (New Zealand, 1961), Associate Professor of Physiology

Joachim R. Sommer, M.D. (Munich, 1950), Associate Professor of Pathology

Madison Stockton Spach, M.D. (Duke, 1954), Associate Professor of Pediatrics

Alexander Spock, M.D. (Maryland, 1955), Associate Professor of Pediatrics

George H. Spooner, Ph.D. (North Carolina, 1958), Assistant Professor of Clinical Pathology

Wilford W. Spradlin, M.D. (Virginia, 1957), Assistant Professor of Psy-

chiatry

William Sprunt, M.D. (Harvard, 1945), Assistant Clinical Professor of Radiology; Chief, Department of Radiology, Wake County Memorial Hospital, Raleigh, N.C.

E. Wilson Staub, M.D. (Northwestern, 1957), Clinical Associate in Sur-

gery, Pinehurst, N.C.

Eugene Anson Stead, Jr., M.D. (Emory, 1932), Florence McAlister Professor of Medicine and Chairman of the Department of Medicine

Donald J. Stedman, Ph.D. (George Peabody Coll., 1962), Assistant Pro-

fessor of Medical Psychology and Lecturer in Psychology

Leonard S. Stein, Ph.D. (Duke, 1966), Instructor in Medical Psychology Frank H. Stelling, M.D. (Med. Coll. of Georgia, 1938), Clinical Lecturer in Orthopaedics; Chief Surgeon, Shriners' Hospital for Crippled Children, Greenville, S.C.

Robert S. Stempfel, Jr., M.D. (Vanderbilt, 1952), Professor of Pediatrics and Associate Professor of Endocrinology and Assistant Professor of

Physiology

Delford L. Stickel, M.D. (Duke, 1953), Associate Professor of Surgery and Chief of Surgery, V.A. Hospital, Durham, N.C.

Frederick W. Stocker, M.D. (Univ. of Bern, 1920), Emeritus Clinical Pro-

fessor of Ophthalmology

Thomas A. Stokes, M.D. (Duke, 1955), Clinical Associate in Obstetrics and Gynecology

Regina Stoner, B.S., Therapeutic Dietitian

Edgar E. Strong, M.D. (Med. Coll. of South Carolina, 1961), Resident and Instructor in Anesthesiology

Jeannette M. Straube, B.S.N., M.S.N. (Duke, 1963, 1965), Instructor in

Nursing

Charles W. Styron, M.D. (Duke, 1938), Assistant Clinical Professor of Medicine, Raleigh, N.C.

Thuneaki Sugimoto, M.D. (Tokyo, 1956), Instructor in Medicine

Lydia Z. Sverak, Ph.D. (Technische Hochshule Vienna, Austria, 1950), Research Associate in Surgery

Louis E. Swanson, A.B. (Hamline, 1941), Assistant Administrative Director, Medical Center, and Associate Professor of Hospital Administration

Charles Tanford, Ph.D. (Princeton, 1947), Professor of Physical Biochemistry

Dorothy Ellen Tate, M.S. (Pennsylvania State, 1946, 1952), Director and Associate Professor of Dietetics

Marguerite Alberta Thiele, A.B. (Duke, 1944), Research Associate in

Thoracic Surgery

Ralph E. Thiers, Ph.D. (Toronto, 1947), Professor of Biochemistry and Director, Clinical Chemistry Laboratories

Walter Lee Thomas, M.D. (Virginia, 1931), Professor of Obstetrics and

Gynecology

Dolly S. Thompson, M.S.W. (North Carolina at Chapel Hill, 1961), Instructor in Psychiatric Social Work

Howard K. Thompson, M.D. (Columbia, 1962), Assistant Professor of Medical Psychology and Lecturer in Psychology

Karen K. Thompson, B.A. (Duke, 1960), Serials Librarian

Larry W. Thompson, Ph.D. (Florida State, 1961), Assistant Professor of Medical Psychology and Lecturer in Psychology

Robert L. Thompson, M.A. (Duke, 1958), Executive Secretary, Com-

mittee on Admissions

Thomas G. Thurston, M.D. (Harvard, 1941), Clinical Associate in Radiology, Rowan Memorial Hospital, Salisbury, N.C.

Magdalena B. Tieffenberg, Ph.D. (Univ. of Buenos Aires, 1962),

Research Associate in Physiology

George T. Tindall, M.D. (Johns Hopkins, 1952), Assistant Professor of Neurosurgery; Chief, Neurosurgical Service, V.A. Hospital, Durham, N.C.

Jon P. Tipton, M.D. (Ohio State, 1960), Instructor in Medicine

Bert R. Titus, C.P., C.O., Director and Assistant Professor of Orthosis and Prosthesis

Juan T. Tomasini, M.D. (Univ. of Madrid, 1962), Instructor in Medicine Russell F. Tomlinson, Ph.D. (Florida, 1957), Assistant Professor of Medical Psychology

Daniel C. Tosteson, M.D. (Harvard, 1949), Professor of Physiology and

Chairman of the Department

Claus Tritschler, Ph.D. (Max Planck Institute, West Germany, 1966), Research Associate in Microbiology

William G. Troyer, M.D. (Pittsburgh, 1960), Associate in Medicine

George P. Tryfiates, Ph.D. (Rutgers Univ., 1962), Instructor in Pharmacology

Annie Mae Truitt, C.R.N.A., Assistant Nurse Anesthetist

Benjamin F. Trump, M.D. (Kansas, 1957), Associate Professor of Pathology

Larry Turner, M.D. (Duke, 1939), Clinical Instructor in Ophthalmology

Malcolm P. Tyor, M.D. (Duke, 1946), Professor of Medicine

Vartan N. Vartanian, M.D. (Cluj. Roumania, 1951), (Duke, 1961), Associate in Anesthesiology

Jacinto J. Vazquez, M.D. (Havana, 1948), Professor of Pathology

Martha Vazquez, M.D. (Havana, 1948), Assistant Professor of Pathology and Assistant Director, School of Cytotechnology

Adriaan Verwoerdt, M.D. (Amsterdam, 1952), Assistant Professor of Psychiatry

Roger G. Vieth, M.D. (Duke, 1959), Resident and Instructor in Neurological Surgery

Emy Villanueva, B.S., R.P.T., Instructor in Physical Therapy.

Osvalko H. Viveros, M.D. (Univ. of Chile, 1962), Research Associate in Pharmacology

F. Stephen Vogel, M.D. (Western Reserve, 1944), Professor of Pathology Joseph A. C. Wadsworth, M.D. (Duke, 1939), Professor of Ophthalmology and Chairman of the Department

Warren E. Wagner, Manager, Hospital Storeroom

Salih J. Wakil, Ph.D. (Washington, 1952), Professor of Biochemistry

Preston A. Walker, M.D. (Med. Coll. of South Carolina), Instructor in Psychiatry

Andrew G. Wallace, M.D. (Duke, 1959), Assistant Professor of Medicine

Abe Walston, II, M.D. (Duke, 1963), Instructor in Medicine

Hsioh-shan Wang, M.D. (National Taiwan Univ. Med. Coll., 1953),
Assistant Professor of Psychiatry and Fellow in Psychiatric Research
Joseph B. Warshaw, M.D. (Duke, 1961), Assistant Professor of Pediatrics
Catherine Wason, B.S. (Univ. of Massachusetts, 1935), Clinic Dietitian
George A. Watson, Jr., M.D. (Duke, 1939), Clinical Associate in Pediatrics

Margaret Ann W. Watson, R.N. (Univ. of Pennsylvania Hospital, 1959), Supervisor, Operating Rooms

John Edmond Wear, M.D. (Alabama, 1945), Clinical Associate in Radiology, Lowrance Hospital, Mooresville, N.C.

Bailey Webb, M.D. (Duke, 1946), Clinical Associate in Pediatrics

David G. Welton, M.D. (Wisconsin, 1935), Clinical Associate in Dermatology, Charlotte, N.C.

Martha L. Wertz, M.S.W. (Tulane Univ. School of Social Work, 1952),

Assistant Professor of Psychiatric Social Work

H. Lake Westfall, M.D. (Duke, 1960), Instructor in Medicine

Robert E. Whalen, M.D. (Cornell, 1956), Associate Professor of Medicine Joseph W. Whatley, Jr., M.D. (Duke, 1958), Clinical Instructor in Pediatrics

Robert W. Wheat, Ph.D. (Washington Univ., 1955), Associate Professor of Microbiology and Assistant Professor of Biochemistry

George A. Whiteside, B.S. (North Carolina, 1956), Assistant Business Manager, Medical Division, Private Diagnostic Clinic

George Dewey Wilbanks, Jr., M.D. (Duke, 1956), Assistant Professor of Obstetrics and Gynecology

Frances L. Wilkie, M.A. (Univ. of Mississippi, 1960), Research Associate in Medical Psychology

Hilda Pope Willett, Ph.D. (Duke, 1949), Professor of Microbiology Leah R. Williams, M.S.W. (Tulane Univ., 1965), Instructor in Psychiatric Social Work

W. C. Williams, Coordinator of Medical Photography

Roston M. Williamson, M.D. (Med. Coll. of Georgia, 1951), Clinical Associate in Obstetrics and Gynecology

James Walter Wilson, Ph.D. (Kentucky, 1965), Instructor in Anatomy William P. Wilson, M.D. (Duke, 1947), Professor of Psychiatry

Stefan S. Winkler, M.D. (Tufts, 1960), Associate in Radiology

Benjamin Wittels, M.D. (Minnesota, 1952), Associate Professor of Pathology

Max Woodbury, Ph.D. (Michigan, 1948), Professor of Bio-Mathematics Barnes Woodhall, M.D. (Johns Hopkins, 1930), Professor of Neurosurgery and Vice Provost, Medical Affairs

Boyd Thomas Worde, M.D. (Tennessee, 1947), Associate Professor of

Radiology

Samuel N. Workman, M.D. (Med. Coll. of South Carolina, 1960), Instructor in Psychiatry

Irene A. Wyatt, M.T. (Bowman Gray, 1948), Instructor in Medical Technology

James O. Wynn, M.D. (Cornell, 1951), Associate Professor of Medicine and Endocrinology

Alvin J. Wyrick, B.S.E.E. (Univ. of Tennessee, 1962), Associate in Radiology

David L. Young, M.D. (Texas, 1956), Assistant Professor of Medicine

W. Glenn Young, Jr., M.D. (Duke, 1948), Professor of Surgery

Marvin E. Yount, Jr., A.B. (Duke, 1941), Clinical Preceptor in Hospital Administration; Administrator, Memorial Hospital of Alamance County

Howard J. Zeft, M.D. (Columbia, 1962), Instructor in Medicine Douglas P. Zipes, M.D. (Harvard, 1964), Instructor in Medicine

Chester Zmijewski, Ph.D. (Univ. of Buffalo, 1960), Associate Professor of Immunology

William K. Zung, M.D. (Texas, 1961), Associate in Psychiatry

House Staff

- John C. Adkins, M.D. (Johns Hopkins, 1965), Assistant Resident in Surgery
- Bipin Agrawall, Ph.D. (Univ. of Michigan, 1967), Postdoctoral Fellow in Biochemistry
- Benjamin L. Allen, M.D. (Duke, 1964), Assistant Resident in Orthopaedic Surgery
- Ann W. Alexander, M.D. (Duke, 1966), Intern in Pediatrics
- James A. Alexander, M.D. (Duke, 1966), Intern in Surgery
- Elizabeth Allen, M.D. (Univ. of Tennessee, 1958), Assistant Resident in Psychiatry
- Richard J. Allgood, M.D. (Univ. of Oklahoma, 1964), Fellow in Surgery Nels C. Anderson, Ph.D. (Purdue, 1964), Fellow in Psychiatry
- John C. Angelillo, D.D.S. (St. Louis, 1957), Assistant Resident in Oral Surgery
- James P. Aplington, M.D. (Johns Hopkins, 1966), Intern in Surgery
- Richard A. Appen, M.D. (Duke, 1966), Intern in Medicine
- Robert L. Applebaum, M.D. (Tulane, 1966), Intern in Surgery
- Jose Mario Arriaga, M.D. (San Carlos, 1963), Assistant Resident in Anesthesiology
- James Duncan Ashe, Jr., M.D. (Med. Coll. of Virginia, 1965), Assistant Resident in Pediatrics
- William H. Atwill, M.D. (Virginia, 1960), Assistant Resident in Urologic Surgery
- Charles Rausch Ayers, M.D. (Duke, 1963), Postdoctoral Fellow in Pediatric Cardiology
- Harry L. Bailey, M.D. (Vanderbilt Univ., 1962), Assistant Resident in Surgery
- L. Bradley Baker, M.D. (Maryland, 1964), Fellow in Obstetrics and Gynecology
- Joseph D. Balentine, M.D. (Med. Coll. of South Carolina, 1963), Fellow in Neuropathology

Charles C. Barringer, M.D. (Jefferson Med. Coll., 1946), Resident in Pathology

Geoffrey H. Basson, M.D. (Pittsburgh, 1965), Assistant Resident in Neurology and Medicine

Monette G. Basson, M.D. (Pittsburgh, 1963), Assistant Resident in Neurology and Medicine

W. Gary Becker, M.D. (Johns Hopkins, 1966), Intern in Pediatrics William R. Bender, M.D. (Duke, 1965), Resident in Radiology

Williard Hall Bennett, M.D. (Tulane, 1954), Resident in Radiology

Gilbert H. Berken, M.D. (Miami, 1963), Resident in Psychiatry

Darrel D. Bigner, M.D. (Duke, 1965), Assistant Resident in Neurosurgery

Minoo H. Bilimoria, Ph.D. (Indian Inst. of Science, 1962), Post-

doctoral Fellow in Biochemistry

Lee B. B. Bloom, M.D. (Tulane, 1966), Intern in Pediatrics

George R. Blumenschein, M.D. (Cornell, 1963), Assistant Resident in Medicine

Sarah D. Blumenschein, M.D. (Cornell, 1964), Postdoctoral Fellow in Pediatric Cardiology

Jack W. Bonner, III, M.D. (Univ. of Texas, Dallas, 1965), Assistant Resident in Psychiatry

Ernest C. Borden, M.D. (Duke, 1966), Intern in Medicine

Edward H. Bossen, M.D. (Duke, 1965), Assistant Resident in Pathology John W. Bradford, M.D. (Duke, 1966), Intern in Pathology

William D. Bradford, M.D. (Western Reserve, 1948), Research Training Fellow in Pathology

Klaus Brendel, Dr.Sch. (Free University, Berlin, 1962), Postdoctoral Fellow in Biochemistry

Kieth Brew, Ph.D. (University of London, England, 1965), Postdoctoral Fellow in Biochemistry

Bruce W. Brient, M.D. (Kansas, 1965), Intern in Surgery

Owen W. Brodie, M.D. (Med. Coll. of Virginia, 1962), Assistant Resident in Psychiatry

George W. Brumley, M.D. (Duke, 1960), Special NIH Fellow in Biochemistry

Lawrence Bryskin, M.D. (Illinois, 1963), Resident in Psychiatry Jerry B. Buchanan, M.D. (Louisville, 1965), Resident in Radiology

J. Andrew Burnam, M.D. (North Carolina, 1963), Assistant Resident in Otolaryngology

Robert B. Burt, B.A. (Univ. of Michigan, 1962), Intern in Psychology Joseph K. Bush, M.D. (Tennessee, 1962), Assistant Resident in Medicine Gene A. Butcher, M.D. (Duke, 1965), Assistant Resident in Medicine Suzanne Butcher, M.D. (Duke, 1964), Assistant Resident in Pathology

Louis A. Cancellaro, M.D. (Duke, 1964), Assistant Resident in Psychiatry

Grayson L. Capp, Ph.D. (Univ. of Oregon, 1967), NIH Postdoctoral Fellow in Biochemistry

Harry M. Carpenter, M.D. (Bowman Gray, 1952), Chief Resident in Medicine

Juan Carranza, M.D. (San Carlos Univ., Guatemala, 1960), Resident in Radiology

Alan B. Carter, M.D. (Duke, 1962), Senior Resident in Pediatrics Charles E. Carter, M.D. (Duke, 1962), Resident in Radiology

Akihiko Chiba, Ph.D. (Tokyo Med. Coll., 1965), Fellow in Surgery

Joe L. Clark, M.D. (Duke, 1966), Intern in Surgery

C. Porter Claxton, M.D. (Virginia, 1961), Assistant Resident in Surgery Robert E. Cline, M.D. (Duke, 1963), Assistant Resident in Surgery

Fred R. Cobb, M.D. (Mississippi, 1964), Assistant Resident in Medicine Harvey J. Cohen, M.D. (State Univ. New York, 1965), Assistant Resident in Medicine

Sherrill A. Conna, M.D. (Duke, 1962), Assistant Resident in Psychiatry Hewlette C. Connell, M.D. (Med. Coll. of Georgia, 1957), Resident in Radiology

Guy Nelson Copeland, Jr., M.D. (Tennessee, 1960), Assistant Resident

in Obstetrics and Gynecology

 Paul D. Cooper, M.D. (St. Louis, 1955), Fellow in Orthopaedic Surgery
 George R. Cousar, Jr., M.D. (Duke, 1960), Resident and Instructor in Ophthalmology

Clyde B. Cox, M.D. (Johns Hopkins, 1959), Resident and Instructor in

Surgery

Glenn R. Cunningham, M.D. (Oklahoma, 1966), Intern in Medicine

Donald P. Currie, M.D. (Duke, 1966), Intern in Surgery

Jerry Danford, M.D. (Duke, 1966), Assistant Resident in Obstetrics and Gynecology

Charles A. Daniels, M.D. (Vanderbilt, 1966), Intern in Pathology

Walter E. Davis, M.D. (Duke, 1966), Intern in Medicine

Harry K. Delcher, M.D. (Florida, 1966), Intern in Medicine Ronald C. Demas, M.D. (Indiana Univ., 1965), Assistant Resident in Psychiatry

Peter J. Dempsey, M.D. (St. Louis Univ., 1966), Intern in Surgery Vincent W. Dennis, M.D. (Georgetown, 1966), Intern in Medicine

Andre P. Derdeyn, M.D. (Univ. of Texas, Dallas, 1963), Assistant Resident in Psychiatry

Barrett W. Dick, M.D. (Washington Univ., 1963), Fellow in Pathology

Fred L. Dinn, M.D. (Duke, 1962), Intern in Medicine

John L. Dodson, M.D. (Duke, 1964), Assistant Resident in Orthopaedic Surgery

Hans O. Doerr, Ph.D. (Florida State, 1965), Fellow in Psychiatry

Keith J. Dorrington, Ph.D. (Sheffield Univ., Great Britain, 1964), Sir Henry Wellcome Traveling Fellow in Biochemistry Anthony R. Dowell, M.D. (Indiana, 1963), Chief Resident in Medicine Belinda A. Drass, M.A. (Northwestern, 1966), Fellow in Psychiatry Doyle Driver, M.D. (Duke, 1963), Assistant Resident in Ophthalmology Krystyna Dronsejko, M.A. (Waterloo, Canada, 1966), Intern in Psychology

Alden W. Dudley, Jr., M.D. (Duke, 1962), Fellow in Neuropathology James E. Dunn, M.D. (Maryland, 1960), Assistant Resident in Surgery Edmund C. Dyas, IV, M.D. (Tulane, 1965), Assistant Resident in Surgery

gery

Thomas T. Edmonds, M.D. (Univ. of Iowa, 1966), Intern in Pathology William G. Edwards, M.D. (Southern California, 1959), Resident and Instructor in Orthopaedic Surgery

William S. Elias, M.D. (Vanderbilt, 1965), Assistant Resident in Neurol-

ogy

George J. Ellis, M.D. (Harvard, 1963), Fellow in Endocrinology Robert D. Ensor, M.D. (Ohio, 1961), Fellow in Urologic Surgery Mark L. Entman, M.D. (Duke, 1963), Assistant Resident in Medicine

Nizamettin Erbakan, M.D. (Istanbul Med. School, 1943), Fellow in Microbiology

Ovidio Escalante, M.D. (Med. School, El Salvador, 1961), Fellow in Psychiatry

Donald C. Ferlic, M.D. (Johns Hopkins, 1961), Assistant Resident in Orthopaedic Surgery

Heriberto Ferrari, M.D. (Buenos Aires, 1954), Assistant Resident in Anesthesiology

Barry W. Festoff, M.D. (Miami, 1966), Intern in Medicine

Gerda G. Fillenbaum, Ph.D. (Univ. London, 1966), Fellow in Psychiatry Robert J. Flemma, M.D. (Rochester, 1960), Resident and Instructor in Surgery

Lewis M. Flint, M.D. (Duke, 1965), Assistant Resident in Surgery Samuel Forbis, M.D. (Tulane, 1959), Resident in Radiology

Raymond F. Ford, M.D. (Duke, 1966), Intern in Pediatrics

Lynn Fort, M.D. (Duke, 1960), Assistant Resident in Surgery

Sidney R. Fortney, M.D. (Duke, 1966), Assistant Resident in Medicine J. Thomas Foster, M.D. (Duke, 1962), Assistant Resident in Ophthalmology

J. Lawrence Frank, M.D. (Duke, 1965), Assistant Resident in Surgery Mark E. Frankel, M.D. (Univ. of Rochester, 1962), Assistant Resident in Surgery

in Surgery

Michael Freund, M.D. (Johns Hopkins, 1964), Assistant Resident in Medicine

Harry Friedman, M.D. (Univ. of Tennessee, 1964), Assistant Resident in Surgery

Robert V. Fulk, Jr., M.D. (North Carolina at Chapel Hill, 1965), Intern in Surgery Robert L. Fuson, M.D. (Indiana, 1961), Assistant Resident in Surgery Andrew J. Gabor, M.D. (Duke, 1963), Assistant Resident in Neurology Cynthia A. Ganung, B.A. (Swarthmore, 1962), Fellow in Psychiatry

John T. Garbutt, M.D. (Temple, 1962), Assistant Resident in Medicine Sutter A. Gardanier, II, M.D. (Univ. of Colorado, 1966), Intern in

Pathology

William A. Gay, M.D. (Duke, 1961), Assistant Resident in Surgery

Herbert J. Gerber, M.D. (Pennsylvania, 1961), Assistant Resident in Pathology

Paul M. Gertman, M.D. (Johns Hopkins, 1966), Intern in Medicine Ruedi P. Gingrass, M.D. (Michigan, 1958), Resident and Instructor in Plastic Surgery

Fred L. Ginn, M.D. (Duke, 1962), Research Training Fellow in Pathol-

ogy

Paul F. Glass, Jr., M.D. (Baylor, 1946), Resident in Psychiatry

Herbert P. Goldman, M.D. (Duke, 1964), Assistant Resident in Psychiatry

William R. Goldston, M.D. (Duke, 1963), Assistant Resident in Obstet-

rics and Gynecology

James H. Gordon, M.D. (Harvard, 1966), Intern in Medicine

Doyle G. Graham, M.D. (Duke, 1966), Research Training Fellow in Pathology

Alfred A. Grant, M.D. (Med. Coll. of Alabama, 1965), Assistant Resident

in Psychiatry

Fred Q. Graybeal, M.D. (Duke, 1965), Assistant Resident in Pathology Matthew H. Grimmett, M.D. (Duke, 1943), Resident in Radiology

Lawrence L. Grundy, M.B. (Otago Med. School, New Zealand, 1962), Resident in Radiology

Roderick L. Guerry, Jr., M.D. (Med. Coll. of Georgia, 1964), Assistant Resident in Neuropathology

Timothy E. Guiney, M.D. (Harvard, 1966), Intern in Medicine

Melvyn R. Haas, M.D. (Georgetown, 1964), Assistant Resident in Psychiatry

E. P. Kirby Hade, Ph.D. (Chicago, 1962), Postdoctoral Fellow in Biochemistry

Thomas M. Haizlip, M.D. (North Carolina, 1958), Fellow in Child Psychiatry

David R. Halbert, M.D. (Penn., 1965), Assistant Resident in Obstetrics and Gynecology

Elliott B. Hammett, M.D. (Duke, 1966), Intern in Medicine

Frank T. Hannah, M.D. (Duke, 1964), Assistant Resident in Ophthal-mology

Randolph T. Harper, M.D. (Ohio State, 1966), Intern in Psychology Nancy R. Haslett, M.D. (Duke, 1963), Resident in Psychiatry

Brack G. Hattler, Jr., M.D. (Cornell, 1961), Assistant Resident in Surgery

David M. Hawkins, M.D. (Duke, 1965), Assistant Resident in Psychiatry Hans M. C. Heick, Ph.D. (Western Ontario, 1964), Research Fellow in Pediatric Metabolism

George P. Henderson, M.D. (North Carolina, 1964), Assistant Resident

in Otolaryngology

John Stephen Herring, Jr., M.D. (Tulane, 1963), Fellow in Endocrinology and Obstetrics and Gynecology

Charles B. Herron, M.D. (Duke, 1966), Intern in Medicine

Jacqueline Hijmans, M.D. (State Univ. of Leyden, 1949), Postdoctoral Fellow in Biochemistry

William F. Hodges, Ph.D. (Vanderbilt Univ., 1967), Intern in Psychology

James W. Holsinger, M.D. (Duke, 1964), Fellow in Surgery

Willis S. Hood, M.D. (Pennsylvania, 1945), Fellow in Radiology

Christie B. Hopkins, M.D. (Duke, 1966), Intern in Medicine

Thomas A. Huff, M.D. (Emory, 1961), Fellow in Medicine and Endocrinology

William M. Hull, Jr., M.D. (Duke, 1963), Resident and Instructor in

Ophthalmology

Betty W. Hydrick, M.D. (Med. Coll. of Virginia, 1965), Assistant Resi-

dent in Psychiatry

Pascall J. Imperato, M.D. (Duke, 1963), Assistant Resident in Medicine Jacquelyne J. Jackson, Ph.D. (Ohio State Univ., 1960), Fellow in Psychiatry

Vishnu Jain, M.D. (Agra Med. Coll., India, 1952), Senior Resident in

Pediatrics

Moukaniza Jarmakani, M.D. (Damascus Univ., 1962), Postdoctoral Fellow in Pediatric Cardiology/Radiology

Charles Johnson, M.D. (Howard, 1963), Fellow in Endocrinology

Kenneth C. Johnson, M.D. (Northwestern, 1965), Assistant Resident in Obstetrics and Gynecology

Robert H. Jones, M.D. (Johns Hopkins, 1965), Assistant Resident in

Surgery

R. L. Stinson Jones, M.D. (Univ. of Texas, Dallas, 1966), Intern in Pediatrics

Richard D. Jordan, M.D. (North Carolina at Chapel Hill, 1961), Resident in Radiology

Vasudev C. Joshi, Ph.D. (Indian Institute of Science, India, 1966), Postdoctoral Fellow in Biochemistry

Stuart W. Kahn, M.D. (Univ. of Texas, Dallas, 1966), Intern in Pediatrics

John P. Kapp, M.D. (Duke, 1962), Fellow in Surgery

John R. Karickhoff, M.D. (Duke, 1964), Assistant Resident in Ophthal-mology

Ronald J. Karpick, M.D. (Yale, 1965), Assistant Resident in Medicine Shigio Kato, M.D. (Nagoya Univ., Japan, 1959), Fellow in Surgery Richard I. Katz, M.D. (Duke, 1965), Assistant Resident in Medicine Bruce Stone Keenan, M.D. (Pennsylvania, 1964), Senior Resident in Pediatrics

Julian D. Kelly, M.D. (Virginia, 1959), Assistant Resident in Orthopaedic Surgery

Terry D. King, M.D. (Univ. of Texas, Galveston, 1965), Assistant Resident in Pediatrics

Albert A. Klein, B.A. (Washington and Jefferson, 1964), Fellow in Psychiatry

George L. Kline, M.D. (Duke, 1966), Intern in Medicine Stewart E. Kohler, M.D. (Duke, 1966), Intern in Medicine

Rufus H. Knott, M.D. (North Carolina at Chapel Hill, 1964), Assistant Resident in Surgery

Yi-hong Kong, M.D. (Taiwan, China, 1958), Fellow in Neurology Richard Kramer, M.D. (Duke, 1962), Assistant Resident in Surgery

Kenneth R. Krauss, M.D. (New York, 1965), Assistant Resident in Medicine

Curtis J. Krock, M.D. (John Hopkins, 1961), Resident in Medicine Ronald Paul Krueger, M.D. (Duke, 1965), Assistant Resident in Pediat-

Raymond J. Kusiak, M.D. (Univ. of Virginia, 1965), Assistant Resident in Surgery

Takahiro Kuwaki, Ph.D. (Okayama Univ., Japan, 1965), Postdoctoral Fellow in Biochemistry

Stephen N. Lang, M.D. (Univ. of Illinois, 1965), Assistant Resident in Surgery

William C. Latham, M.D. (North Carolina, 1962), Assistant Resident in Pathology

Michael H. Leakan, M.D. (Maryland, 1960), Resident in Pathology J. Fletcher Lee, M.D. (Duke, 1960), Resident and Instructor in Neurosurgery

Wade H. Lefler, Jr., M.D. (Bowman Gray, 1963), Assistant Resident in Ophthalmology

William B. Lehmann, M.D. (Yale, 1963), Assistant Resident in Otolaryngology

William A. Leitner, M.D. (Med. Coll. of Ala., 1964), Assistant Resident in Surgery

Alvin M. Lewis, M.D. (Duke, 1966), Intern in Pediatrics

Edward L. Lewis, M.D. (Duke, 1963), Assistant Resident in Medicine Kay Riffle Lewis, M.D. (Duke, 1964), Senior Resident in Pediatrics

Philip M. Lewis, M.A. (Syracuse Univ., 1966), Intern in Psychology

Clinton R. Lincoln, M.D. (Med. Coll. of Virginia, 1960), Assistant Resident in Orthopaedic Surgery

Richard A. Lioguori, M.D. (Duke, 1963), Resident in Psychiatry Gerald Logue, M.D. (Pittsburgh, 1966), Intern in Medicine

Leif A. Lohrbauer, M.D. (Duke, 1966), Intern in Medicine

Eugene Monroe Long, II, M.D. (Duke, 1963), Fellow in Obstetrics and

Gynecology and Endocrinology

John R. Lovvorn, M.D. (Emory, 1960), Assistant Resident in Psychiatry Steven Lunzer, M.D. (Budapest, Hungary 1947), Fellow in Psychiatry

James L. Males, M.D. (Oklaĥoma, 1966), Intern in Medicine

Joseph M. Malin, M.D. (Georgetown Univ., 1961), Fellow in Surgery Joseph L. Mancusi, M.S. (Iowa State, 1964), Fellow in Psychiatry

Jean M. Martin, Ph.D. (Florida State, 1965), Fellow in Psychiatry

Bettie Sue Masters, Ph.D. (Duke, 1963), American Heart Association, Advanced Research Fellow in Biochemistry

Robert S. Mathews, M.D. (Duke, 1964), Assistant Resident in Orthopaedic Surgery and Pathology

Robert H. Mathog, M.D. (New York, 1964), Assistant Resident in Surgery

F. Maxton Mauney, Jr., M.D. (Duke, 1959), Assistant Resident in Surgery

Jackson H. McCarter, M.D. (Pittsburgh, 1963), Assistant Resident in Pathology

Robert W. McConnell, M.D. (Med. Coll. of Virginia, 1959), Resident in Radiology

Michael E. McLeod, M.D. (Duke, 1960), Fellow in Medicine

Jesse N. McNiel, M.D. (Arkansas, 1960), Resident in Psychiatry

Christine E. McRee, M.D. (Tulane, 1946), Fellow in Child Psychiatry Ben Miller Meares, M.D. (Med. Coll. of South Carolina, 1964), Resident in Radiology

Joel E. Mikell, M.D. (Georgia, 1961), Resident in Radiology

Momcilo A. Miljkovic, Ph.D. (Eidg. Technische Hochschule, Switzerland, 1965), Postdoctoral Fellow in Biochemistry

Douglas J. Miller, M.D. (Meharry, 1966), Intern in Medicine

George D. Miller, M.D. (Georgia, 1961), Assistant Resident in Medicine Frederick V. Mindow, M.D. (Univ. of Michigan, 1964), Assistant Resident in Surgery

Joseph Sheppard Minus, M.D. (Duke, 1965), Assistant Resident in Pedi-

atrics

Michinao Mizugaki, Ph.D. (Tohoku University, Japan, 1966), Post-Doctoral Fellow in Biochemistry

Richard Mladick, M.D. (Northwestern, 1959), Assistant Resident in Plastic Surgery

Gordon F. Moor, M.D. (Nebraska, 1959), Assistant Resident in Surgery

Claude T. Moorman, M.D. (Duke, 1966), Intern in Surgery Frank H. Morris, Jr., M.D. (Duke, 1966), Intern in Pediatrics

Robert L. Morris, B.S. (Univ. of Pennsylvania, 1963), Fellow in Psychiatry

William C. Mottola, M.S. (Purdue, 1966), Intern in Psychology

Donald C. Mullen, M.D. (Duke, 1961), Assistant Resident in Surgery

Lilli H. Musella, Ph.D. (McGill, 1963), Fellow in Psychiatry

Allen Nadler, M.D. (Western Reserve Univ., 1962), Fellow in Endocrinology

Ira R. Nadler, M.D. (Western Reserve Univ., 1963), Resident in Psychiatry

Hiroshi Nagaya, M.D. (Tokyo, 1956), Resident in Medicine

Richard J. Nasca, M.D. (Georgetown, 1964), Assistant Resident in Surgery

James L. Nash, M.D. (Duke, 1966), Intern in Medicine

Albert R. Newsome, M.D. (North Carolina at Chapel Hill, 1961), Assistant Resident in Medicine

Zachariah B. Newton, III, M.D. (Jefferson Med. Coll., 1962), Assistant Resident in Obstetrics and Gynecology

Frank Irvin Nicks, Jr., M.D. (Duke, 1961), Resident in Obstetrics and Gynecology

Charles J. Niemeyer, M.D. (Duke, 1966), Intern in Surgery

Laurence B. Nilsen, M.D. (Cornell, 1962), Assistant Resident in Medicine

James J. Nordlund, M.D. (Minnesota, 1965), Assistant Resident in Medicine

Charles B. Norton, M.D. (Duke, 1966), Intern in Medicine

James G. Nuckolls, M.D. (Duke, 1966), Intern in Medicine

James T. Nunnally, III, M.D. (Med. Coll. of Georgia, 1959), Resident in Psychiatry

Linda C. Obenour, M.D. (Duke, 1966), Intern in Pediatrics

William H. Obenour, M.D. (Duke, 1966), Intern in Medicine

Benjamin R. Ogburn, M.D. (Med. Coll. of Virginia, 1956), Resident in Psychiatry

Muneo Ohkido, M.D. (Keio Univ., Japan, 1960), Postdoctoral Fellow in

Biochemistry

H. Newland Oldham, M.D. (Baylor, 1961), Assistant Resident in Surgery Michael T. O'Neil, M.D. (Nebraska, 1963), Assistant Resident in Orthopaedic Surgery

Robert T. Osteen, M.D. (Duke, 1966), Intern in Medicine

John B. Otis, M.D. (Vanderbilt, 1962), Assistant Resident in Pathology Charles H. Parker, M.D. (Pittsburgh, 1964), Assistant Resident in Obstetrics and Gynecology

Jeremiah N. Partrick, D.D.S. (Georgetown Univ., 1965), Assistant Resi-

dent in Oral Surgery

David L. Pearsey, M.D. (Baylor, 1962), Resident and Instructor in Otolaryngology

Vito A. Perriello, Jr., M.D. (Duke, 1966), Intern in Pediatrics

Paul J. Phillippi, M.D. (Tennessee, 1956), Resident in Medicine

Honorato H. Piedad, M.D. (Univ. Inst. of Manilla, Philippines, 1954), Fellow in Radiology

Marvin Pomerantz, M.D. (Rochester, 1959), Resident and Instructor in

Surgery

John M. Porter, M.D. (Duke, 1962), Assistant Resident in Surgery

Gerald F. Powell, M.D. (Marquette Univ., 1957), Postdoctoral Fellow in Pediatric Cardiology

Geraldine Keating Powell, M.D. (Johns Hopkins, 1964), Postdoctoral

Fellow in Pediatric Research

John Gary Powell, M.D. (Duke, 1965), Assistant Resident in Pediatrics Thomas Pozefsky, M.D. (New York, 1962), Assistant Resident in Medicine

Andrew R. Price, M.D. (Duke, 1965), Assistant Resident in Medicine James A. Price, M.D. (Arkansas, 1962), Assistant Resident in Ophthalmology

William H. Prioleau, M.D. (Virginia, 1960), Assistant Resident in

Pathology

Charles L. Puckett, M.D. (Bowman Gray, 1966), Intern in Surgery

Vichit Punyahotra, M.D. (Chukalongkorn Univ., Thailand, 1952), Assistant Resident in Surgery

Kenneth E. Quickel, M.D. (Johns Hopkins, 1964), Assistant Resident in

Medicine

Michael G. Quinn, M.D. (Univ. of Miami, 1965), Assistant Resident in Pathology

Rudolfo Quiroga, M.D. (Univ. of Nuevo Leon, 1961), Fellow in Neuro-

pathology

John N. Ralsten, M.D. (West Virginia, 1965), Resident in Radiology Kenneth P. Ramming, M.D. (Duke, 1965), Assistant Resident in Surgery Joe A. Rand, M.D. (North Carolina at Chapel Hill, 1961), Postdoctoral Fellow in Pediatric Hemotology

Waguih M. Raphael, M.D. (Cairo, 1957), Resident in Medicine

Norman Ratliff, M.D. (Duke, 1962), Research Training Fellow in Pathology

Karl A. Ray, M.D. (Duke, 1966), Intern in Pediatrics

James C. Řepass, M.D. (Med. Coll. of Virginia, 1961), Fellow in Child Psychiatry

Vade G. Rhoades, M.D. (Bowman Gray, 1960), Chief Resident in Medicine

Daniel P. Rignault, M.D. (Univ. of Paris, France, 1957), Fellow in Surgery

Charles P. Riley, M.D. (Duke, 1965), Assistant Resident in Medicine Jesse E. Roberts, M.D. (Louisiana State, 1961), Assistant Resident in Medicine

Arvin E. Robinson, M.D. (Med. Coll. of Virginia, 1964), Resident in Radiology

David W. Robinson, M.D. (Univ. of Michigan, 1962), Assistant Resident in Psychiatry

Wilson Rocha, M.D. (Univ. of Minas Gerais, Brazil, 1953), Postdoctoral

Fellow in Pediatric Allergy

Bradley M. Rodgers, M.D. (Johns Hopkins, 1966), Intern in Surgery Larry A. Rogers, M.D. (Duke, 1965), Assistant Resident in Surgery

Lon E. Rogers, M.D. (Southwestern Med. School, 1959), Postdoctoral Fellow in Pediatric Hematology

Daniel W. Rose, M.D. (Virginia, 1960), Resident and Instructor in Otolaryngology

Richard J. Rosen, M.D. (George Washington, 1955), Resident in Medicine

Stephen G. Rostand, M.D. (Tufts, 1965), Assistant Resident in Medicine Michael Rotman, M.D. (Texas, 1966), Intern in Medicine

James Bristol Rouse, M.D. (Duke, 1965), Assistant Resident in Pediatrics

Marvin P. Rozear, M.D. (Duke, 1966), Intern in Medicine

Jack V. Rozwadowski, M.D. (Hahneman Med. Coll., 1964), Assistant Resident in Pathology

Carl J. Rubenstein, M.D. (Duke, 1964), Resident in Medicine

Novello E. Ruggiero, M.D. (Univ. of Vermont, 1952), Assistant Resident in Surgery

Jerome Ruskin, M.D. (Albert Einstein, 1960), Resident in Medicine

Harvey Ruskin, M.D. (Michigan, 1963), Assistant Resident in Urologic Surgery

Edwin A. Rutsky, M.D. (Western Reserve, 1965), Assistant Resident in Medicine

Jerome E. Rygorski, M.D. (Columbia, 1962), Assistant Resident in Medicine

Tomomi Sakurado, Doctor of Medical Science (Keio School of Medicine, Japan, 1957), Postdoctoral Fellow in Biochemistry

Bruce M. Schlein, M.D. (State Univ. of New York, Downstate Medical Center, 1963), Assistant Resident in Pathology

Roberto E. Schneider, M.D. (San Carlos, 1960), Resident in Medicine

H. Schults-Holthausen, Ph.D. (Univ. of Freiburg, Germany, 1963), Post-doctoral Fellow in Biochemistry

Robert J. Schwartzman, M.D. (Pennsylvania, 1965), Assistant Resident in Medicine

George S. Scott, M.D. (Duke, 1966), Intern in Medicine

William Beal Scroggie, M.D. (Southwestern Med. School, 1964), Chief Resident in Pediatrics

James C. Seabury, Jr., M.D. (Duke, 1960), Resident and Instructor in Urologic Surgery

Alvin J. Secrest, M.D. (Bowman Gray, 1963), Assistant Resident in Urologic Surgery

Jack B. Sewell, M.D. (Mississippi, 1966), Intern in Medicine

James K. Sexton, M.D. (Bowman Gray, 1957), Resident in Radiology Martin I. Shapiro, Ph.D. (McGill Univ., Canada, 1965), NIH Postdoctoral Fellow in Biochemistry

Bagher Sheikholislam, M.D. (Univ. of Teheran, Iran, 1958), Postdoctoral

Fellow in Pediatric Research

Kenro Shirahige, M.D. (Okayama Univ., Japan, 1961), Fellow in Surgery

W. Derek Shows, Ph.D. (Duke, 1967), Intern in Psychology

Kirkwood T. Shultz, M.D. (Duke, 1966), Assistant Resident in Medicine Sally A. Sibley, Ph.D. (Florida State, 1966), Fellow in Psychiatry

Lewis M. Siegel, Ph.D. (Johns Hopkins University, 1965), Postdoctoral

Fellow in Biochemistry

Michael H. Siegelman, M.D. (New York, 1961), Resident in Medicine D. Graham Slaughter, M.D. (Duke, 1964), Assistant Resident in Neurosurgery

Michael P. Small, M.D. (Louisville, 1962), Resident and Instructor in

Urologic Surgery

David L. Smith, M.D. (Duke, 1966), Intern in Medicine

Paul B. Smith, M.D. (Med. Coll. of South Carolina, 1963), Resident in Psychiatry

Ralph Snyderman, M.D. (State Univ. New York, 1965), Assistant Resident in Medicine

Michael R. Sottarelli, M.D. (Seton Hall Coll. of Med., 1963), Resident in Psychiatry

Peter D. Springberg, M.D. (Wisconsin, 1966), Intern in Medicine

Milton M. Stephens, M.D. (Texas, S.W., 1962), Assistant Resident in Orthopaedic Surgery

Harry B. Stone, III, M.D. (Duke, 1965), Assistant Resident in Surgery

Richard C. Stone, M.D. (Duke, 1965), Resident in Medicine

Karl David Straub, M.D. (Duke, 1965), NIH Postdoctoral Fellow in Biochemistry

J. Robert Swanson, Ph.D. (Washington State, 1965), N.I.H. Post-doctoral Fellow in Biochemistry

J. B. Sullivan, Ph.D. (Texas, 1965), Postdoctoral Fellow in Biochemistry Toshio Takagi, Ph.D. (Osaka Univ., Japan, 1962), Postdoctoral Fellow in Biochemistry

I. Helene Talton, M.D. (Univ. of Heidelberg, 1951), Fellow in Psychiatry
 Jean F. Taylor, M.D. (Univ. of Oregon, 1949), Fellow in Geropsychiatry
 Lawrence A. Taylor, M.D. (North Carolina, 1963), Research Training
 Fellow in Pathology

Nelson S. Teague, M.D. (Bowman Gray, 1962), Fellow in Surgery

Barry R. Tharp, M.D. (Cornell, 1962), Chief Resident in Medicine and Fellow in Neurology

Raymond L. Thomas, M.D. (Duke, 1963), Resident in Radiology

Lawrence K. Thompson, III, M.D. (Duke, 1961), Assistant Resident in Plastic Surgery

Thomas T. Thompson, M.D. (Med. Coll. of Virginia, 1964), Resident in Radiology

Frank L. Thorne, M.D. (Pennsylvania, 1957), Assistant Resident in Plastic Surgery

Larry K. Totten, M.D. (Duke, 1964), Resident in Radiology

John H. Trant, III, M.D. (Duke, 1961), Assistant Resident in Ophthalmology

Otho L. Trick, M.D. (Indiana, 1958), Resident in Psychiatry

H. Tritschler, Ph.D. (Univ. of Freiburg, Germany, 1965), Postdoctoral Fellow in Biochemistry

Norman Tudball, Ph.D. (Cardiff Univ., Wales, 1959), Postdoctoral Fellow in Biochemistry

Thomas C. Tyler, M.D. (Loyola Univ., 1966), Intern in Surgery

James R. Urbaniak, M.D. (Duke, 1962), Assistant Resident in Surgery

Randall B. Vanderbeek, M.D. (Duke, 1963), Assistant Resident in Surgery

Frank W. Varese, M.D. (Univ. of Bologna, 1965), Assistant Resident in Psychiatry

Thomas G. Vaughan, M.D. (Med. Coll. of Virginia, 1963), Resident in Radiology

Jean Vorhaben, Ph.D. (Tulane, 1965), Postdoctoral Fellow in Biochemistry

Anthony E. Voytovich, M.D. (State Univ. New York, 1964), Resident in Medicine

Galen S. Wagner, M.D. (Duke, 1965), Assistant Resident in Medicine Lawrence C. Walker, M.D. (Duke, 1960), Assistant Resident in Obstetrics and Gynecology

James L. Ware, M.D. (Med. Coll. of Virginia, 1959), Resident and

Instructor in Plastic Surgery

Burton B. Weber, M.D. (Univ. of Pittsburgh, 1966), Intern in Surgery Carl H. Weber, Jr., M.D. (Duke, 1960), Assistant Resident in Urologic Surgery

Paul D. Webster, M.D. (Bowman Gray, 1956), Resident in Medicine

Gerald Weeks, Ph.D. (Univ. of Birmingham, England, 1966), Post-doctoral Fellow in Biochemistry

William B. Weglicki, M.D. (Maryland, 1962), Resident in Medicine

Samuel A. Wells, Jr., M.D. (Emory, 1961), Assistant Resident in Surgery

Jacqueline H. Werner, M.D. (Georgetown, 1964), Assistant Resident in Pathology

Charles E. Wells, M.D. (Emory, 1953), Assistant Resident in Psychiatry Linton B. West, Jr., M.D. (Vanderbilt, 1962), Assistant Resident in Surgery

Thomas E. Williams, D.D.S., New Jersey Coll., Intern in Surgery

Walter G. Wolfe, M.D. (Temple, 1963), Assistant Resident in Surgery Samuel N. Workman, M.D. (Med. Coll. of South Carolina, 1960), Chief Resident in Psychiatry

Kinsman E. Wright, M.D. (Boston Univ., 1964), Assistant Resident in

Medicine

Thomas W. Wyatt, M.D. (Florida, 1956), Assistant Resident in Obstetrics and Gynecology

David H. Young, M.D. (Univ. of Oklahoma, 1966), Intern in Surgery Noel W. Young, Jr., M.D. (Duke, 1963), Assistant Resident in Ophthalmology

Robert Yowell, M.D. (Duke, 1961), Fellow in Obstetrics and Gynecol-

ogy

Mario H. Zarlengo, M.D. (Colorado, 1963), Postdoctoral Fellow in Biochemistry

Lewis G. Zirkle, Jr., M.D. (Duke, 1966), Intern in Surgery

Sara Kay Shilling Zirkle, M.D. (Duke, 1965), Senior Resident in Pediatrics



General Information

In 1924, James Buchanan Duke established The Duke Endowment,

and thus made possible the creation of Duke University.

"I have selected Duke University," he said, "as one of the principal objects of this Trust because I recognize that education, when conducted along sane and practical, as opposed to dogmatic and theoretical lines, is,

next to religion, the greatest civilizing influence."

One year later, and ten days before his death, Mr. Duke added a sum to The Duke Endowment for the creation of a medical school, hospital, and nurses' home at Duke University. At that time he wrote: "I have selected hospitals as another of the principal objects of this Trust because I recognize that they have become indispensable institutions."

The organization, development, and direction of the new Medical Center was entrusted to an outstanding medical scientist and educator, Dr. Wilburt C. Davison, who was appointed the first Dean of the School

of Medicine.

Selection of an outstanding faculty was of primary importance. After careful consideration, the Medical Center elected to follow the examples set by Ford Hospital and Vanderbilt in the methods of selecting faculty. It was also decided to follow Osler's dictum of keeping the average age of the faculty under thirty-five years. Invitations to become professors at Duke University Medical Center were then extended to residents of various services at the Johns Hopkins University Medical Center.

Construction of the Medical Center began, based on the collegiate Gothic plan which had been approved by Mr. Duke before his death.

Wards and clinics were named for eminent physicians and surgeons in order to remind the staff and students of what has been accomplished in medicine, as well as to follow Mr. Duke's Indenture: "I advise courses in history, especially the lives of the great of the earth."

The Council on Medical Education and Hospitals of the American Medical Association gave Duke Class A approval in 1929 before the

faculty and buildings were completed.

Announcements were then inserted in college papers that applications for the study of medicine, nursing, dietetics, hospital administration, and

other health professions would be considered in 1930.

Duke Hospital was opened for patients on July 21, 1930. The first students in hospital administration were admitted on July 1, 1930; the first dietetic student on August 15, 1930; the first medical students (1st and 3rd year) on October 2, 1930; and the first student nurses on January 2, 1931. The schools and hospital were dedicated on April 20, 1931.

On the advice of Dr. Harvey Cushing and Dr. Henry A. Christian of Harvard, most of the faculty were appointed on "geographic" full time, so that private patients could obtain as good medical and surgical care as that given to the charity patients. Therefore, on September 15, 1931, the Private Diagnostic Clinic (PDC) was organized to improve the facilities

for private patients, especially for those of moderate means.

Soon other additions became necessary, as students, faculty, and patients increased in numbers. The Baker House (originally for nurses, 1932) and the PDC wing (June, 1940) were provided by The Duke Endowment and Duke University. The W. B. Bell Research Building was started in 1940 with funds from the PDC, the Rockefeller Foundation, the Dorothy Beard Research Fund, and The Duke Endowment and was expanded by funds from the National Institutes of Health, the Markle Foundation, and Duke University. The Erwin Road Nurses' Dormitory (now Hanes House Annex) was built (1943) with funds from The Duke Endowment and the U. S. Public Health Service. The Elizabeth P. Hanes House for Nurses (1950) was a gift from Mrs. Frederic M. Hanes, with additional funds from the N. C. Medical Care Commission. The North Carolina Cerebral Palsy Hospital, which is directed by Duke, was dedicated on March 30, 1950. The Durham Veterans Administration Hospital, which is affiliated with Duke, was completed and dedicated in 1953. The W. S. Rankin Outpatient and PDC wing (1954) were financed by the PDC, The Duke Endowment, and the N. C. Medical Care Commission. The Geriatrics and the Diagnostic and Treatment wings (1963) were built with funds from the National Institutes of Health, the PDC, and The Duke Endowment.

Today, Duke University Medical Center continues to strive to lead and not lag the contemporary medical scene. This involves maintaining superiority in its four primary functions: unexcelled patient care, dedication to its educational programs, national and international distinction in the

quality of its research, and service to the region.



Growth is identified with a deeper involvement in the social aspects of health, the establishment of many advanced therapeutic and research facilities, a building program that will require one or more decades for its completion, and a new and imaginative revision of the medical teaching program that has attracted the attention of educators across the globe.

In the years to come, Duke University Medical Center will continue to adapt, experiment, and innovate in all aspects of its functions, basing changes upon its traditions and upon its aspirations for service to mankind everywhere.

Courses of Study and Requirements for Degrees

The New Medical Curriculum

In recent years, analysis and appraisal of the curriculum in medical schools has caused changes in many. Several factors have required these changes, important among them being the increasing scope and complexity of medicine generally, and the dissatisfaction with the sharp cleavage between basic science and clinical years. As a result of long study, the Duke University School of Medicine instituted a major revision of the curriculum beginning with the class starting in the Fall of 1966.

The aims of the new curriculum are: (1) to provide a strong academic basis for a lifetime of growth within the profession of medicine, with the development of technical competency, proficiency, and the proper attitudes peculiar to the practice of medicine as well as appreciation of the broader social and service responsibilities; (2) to establish for the first year a basic science program which will fulfil the purposes of the increasingly heterogeneous student body; (3) to offer both clinical and basic science education simultaneously; (4) to permit the student to explore his personal intellectual preferences and capabilities; (5) to allow study in depth in selected areas, either clinical or basic science; (6) to provide greater freedom of course selection and thus to encourage earlier career decision; and (7) to achieve better

integration of the medical school curriculum with residency training and

the practice of medicine.

The curriculum, while offering a previously unattainable degree of flexibility to medical education and new opportunities for intellectual exploration, also makes heavy demands upon the student. It should be recognized that a medical student at Duke University School of Medicine is expected to maintain a consistent level of attainment and to demonstrate qualities of initiative and dedication to his chosen profession. A scholarly attitude to medicine that will continue throughout an entire career is an important objective of the medical school. The foundations of this attitude to learning should accompany the student when he enters.

It is expected that students will dedicate daily several hours to private study, utilizing the resources available in the Medical Center library and those provided by themselves and by other facilities of Duke University. During the University term, private study should also occupy part of each

weekend.

The new curriculum calls for major contributions of independent effort and individual initiative from the first day of medical school onward. Members of the medical school faculty should be regarded not as the teachers of didactic information but as guides to learning, whose opinions

may be questioned in sincerity.

A student is expected to maintain at all times a professional attitude toward patients, to respect confidences and to recognize that he is the recipient of privileged information only to be discussed within the context of scholarship and in circumstances that truly contribute to the educational process or the care of the patient. This attitude involves consideration not only of speech and dress but also of morality, honor, and integrity.

A special examination will be taken annually by all medical students enrolled in the new curriculum. The examination, comprising two 3-hour papers, is administered on a single day each year, shortly preceding Part I of the National Board Examinations. Freshmen medical students take this examination on the second day of medical school, in addition to subsequent examinations in June. Grade weighting is attached to these examination results and will be recorded in each student's record.

Doctor of Medicine Degree

The degree of Doctor of Medicine is awarded upon approval by the faculty of Duke University to those students who have completed the curriculum of the School of Medicine to the satisfaction of the Medical School Advisory Committee, and who have demonstrated their fitness to practice medicine by adherence to a high standard of ethical behavior and

morality and paid or made satisfactory arrangements to pay all indebtedness to the University.

Course Requirements

First Year

The student will study the basic principles of all the preclinical disciplines. Rather than mastering an encyclopedic array of facts, the purpose will be to acquire familiarity with the major principles of each subject. As an introduction to medicine, physical diagnosis, and clinical microscopy will be presented by the clinical services. The year will be divided into two terms, each of eighteen weeks, as follows:

Term I	Hours
Anatomy	252
Biochemistry	205
Physiology	205
Human Behavior	49
Free Time (Study, etc.)	
	$\frac{90}{801}$
Term II	Hours
Pathology	235
Microbiology	168
Pharmacology	139
Human Behavior	11
Physical Diagnosis	54
Genetics	36
Clinical Microscopy	54
Free Time (Study, etc.)	104
	801

Second Year

The second year will provide an exposure to clinical disciplines permitting the student early in his career to become a participant in the care of patients. The acquired appreciation of the problems of the clinical areas and the opportunities to recognize the applications of the basic sciences should lead to a more meaningful selection of courses for the subsequent two years. The second year will be divided into five terms of seven weeks each as follows:

Medicine	7 weeks
Obstetrics	7 weeks
Pediatrics	7 weeks
Psychiatry	7 weeks
Surgery	7 weeks
Community Health Sciences	70 hours

Third and Fourth Years

These two years will be made up of elective courses, as flexible as possible within requisite limitations. Each student will have an advisor and two tutors, one from the preclinical and one from the clinical faculty. These individuals, with the Office of the Dean, will assist the student in formulating his program for the third and fourth years. Maximum and minimum course load requirements will be established. Approximately one-half the time will be spent in basic science and one-half in clinical science. The student will be advised to spend substantial time in medicine and surgery. Completion of the Medical Research Training Program may fulfil the requirements for basic science.

The elective courses of study offered are described under each department. The combinations are too varied to be enumerated. The wide selection, however, affords an opportunity for each student to design his program to satisfy best his needs in conformity with his

medical future.

As an alternative after completion of the second year, the student may enroll as a Ph.D. candidate in one of the basic sciences, earning this degree in two or three years. Then, having completed three of the four years necessary for an M.D., he may earn the M.D. degree by completing a fourth clinical year.

The third and fourth years will be divided into four quarters of nine weeks each. Certain courses as noted will be offered during the summer

term.

Promotion

The records of each student in the first and second years are reviewed periodically by promotion committees, which are made up of the department chairmen. The Medical School Advisory Committee acts on recommendations from these promotion committees and may:

1. Promote to the next year those students whose work is good.

2. Warn those students whose work is less than good that they must improve their scholastic endeavor.

3. Place on probation those students whose work is poor.

4. Request the resignation of any student who is considered an unpromising candidate for the degree of Doctor of Medicine.

A student wishing to appeal this decision may do so to the Dean within two weeks of his notification.

The Dean, with the advice of the Medical School Advisory Committee, reserves the right to require the withdrawal of any student at any time if, in the opinion of the majority of committee members, he should not continue his course.

At the end of the third year, each student will be required to take Part I of the National Board Examinations.

Bachelor of Science in Medicine*

The degree of Bachelor of Science in Medicine is conferred upon those students who have fulfilled the following requirements: (1) completed two academic years at the Duke University School of Medicine with performance in all courses at the level of "Good" or better; (2) received approval of a research program to be conducted under the sponsorship of a faculty member and with the consent of the head of the department in which the work is to be done; (3) received written permission from the Assistant Dean for Medical School Affairs before beginning the program; (4) completed creditable, original investigative work of his own under the supervision of an advisory committee of which the faculty sponsor will be chairman and appointed by the chairman of the appropriate department; (5) completed a written report of the investigation, in the form of a thesis in the format meeting the requirements of the Graduate School of Arts and Sciences, which has been accepted by the advisory committee following an oral examination; and (6) submitted two bound copies and one unbound copy to the Assistant Dean for Medical Student Affairs not later than February 1 prior to the anticipated date of graduation with the M.D. degree.

No credit toward this degree is given for additional college work. All students in good standing are encouraged to undertake work towards this degree in addition to their work toward the degree of Doctor of Medicine. Application should be made to the Office of the Assistant Dean for Medical Student Affairs for guidance in establishing the program and for aid

in fulfilling these requirements.

Combined M.D.-Ph.D. Training Programs

Medical Historian Training Program

General Information

The Medical Historian Training Program is conducted under the auspices of the School of Medicine and the Graduate School of Arts and Sciences and is supported by the Josiah Macy, Jr. Foundation. It is constructed to provide professionally trained medical historians to fill some of the shortages of teachers and research workers that exist in universities throughout this country, and it is intended to provide a unique

°The Bachelor of Science in Medicine degree will not be offered after September 1, 1967.

training opportunity for a small number of highly selected students who anticipate careers in the fields of medicine and medical history. A minimum of six years of graduate study is required, with successful completion leading to both the Doctor of Medicine and Doctor of Philosophy degrees. It is anticipated that graduates of the program will undertake at least one year in postgraduate medical training before embarking on careers in the history of medicine.

Eligibility

Applicants must meet the requirements for admission to both the School of Medicine as a candidate for the M.D. degree and the Graduate School of Arts and Sciences as a candidate for the Ph.D. degree in the Department of History. Applications will be accepted from candidates who wish to enter the program in the first year of medical studies.

In addition to the minimum requirements established by the School of Medicine and the Graduate School, additional course work in history and the history and philosophy of science will count heavily in the

selection of candidates.

Financial Support

Students accepted will be offered a traineeship award which includes

a stipend and a full tuition allowance.

The award, which will support the trainee throughout a six-year combined program as long as his progress is good, includes allowances of \$500 per annum for each dependent and limited travel expenses to attend meetings in the history of medicine. Stipend levels (exclusive of allowances) begin at \$2400 per year, and annual increments raise this to a maximum of \$5500.

The Training Program

The program has been designed to offer the student a great latitude in the selection of his course material, but the basic requirements will be those described in the following example of a typical program. During the first two academic years, full-time courses in the School of Medicine will be followed. The first year comprises the "core" basic science year and the second the "core" clinical science year. At the end of the second year the student enters the graduate program.

Typically, a candidate for the Ph.D. degree in history devotes approximately two full years to the completion of his required courses, work in seminars, writing an M.A. thesis, and in preparatory study for his preliminary or qualifying examinations. The actual length of time needed to earn the Ph.D. degree depends upon the number of months beyond this two-year period a candidate finds it necessary to devote to research and the writing of his dissertation. The candidate will pursue these studies in the Department of History during the third and fourth

academic years of the program.

In the fifth and sixth years, the trainee will return to medical studies and follow the very flexible elective program offered in the third and fourth years of the curriculum of the School of Medicine. During this time a total of up to one quarter can be made available for completing the Ph.D. degree in history. Elective credit for this period will be accepted toward completing the requirements for the M.D. degree.

The original research and dissertation of each student will be supervised by a faculty advisor chosen by the student in consultation with the director of graduate studies in the Department of History. It is not required that the faculty advisor be a member of the department in which the student will take his degree; therefore, it is possible for a student to undertake dissertation work at another institution in this country or abroad. If the personal interests or required research of the individual student demand work away from Duke for any considerable period of time, the anticipated schedule for completion of the double-degree program may be somewhat extended; but it is anticipated that a total of six years will normally prove adequate.

Following the sequence described above, a candidate could complete the requirements for the M.A. degree in history by the end of the fourth academic year of the program. By the end of his sixth year, he could

receive both the M.D. and Ph.D. degrees.

Students in the program will be expected to devote the summer following completion of their first year in medical school working in some aspect of the history of medicine to prepare for the regular course work in history that will begin in the third academic year of the program.

Application and Admission Procedure

1. Complete the application form for the Duke University School of Medicine.

2. After preliminary screening, selected candidates will be asked to submit an application to the Graduate School of Duke University for

admission to the Department of History.

3. Customarily, the selection of the trainees will be made from a group of finalists who will be interviewed at Duke University. Applicants will

be notified of their status not later than January 10.

Application forms and further information may be obtained by writing to the Associate Director, Medical Historian Training Program, Box 3005, Duke University Medical Center, Durham, North Carolina 27706.

Medical Scientist Training Program

General Information

The Medical Scientist Training Program is conducted under the auspices of the School of Medicine and the Graduate School of Arts and Sciences and is designed for highly qualified students strongly motivated toward a career in medical sciences. It will provide them with the opportunity to obtain a graduate education in one of the medical sciences while providing exposure to clinical medicine. The program will require six to seven years of study and will lead to both an M.D. and a Ph.D. degree. While the emphasis of this program is on basic medical science, the students, because of their clinical training, will have open to them a remarkable range of career opportunties. It is probable that the graduates of the Program will follow one of two broad paths. Some will embark directly on careers in teaching and research in one of the basic medical sciences, hopefully having acquired some understanding of clinical medicine in this Program. Others will enter residency programs with a background of experience in basic science which will allow them to pursue research careers in clinical medicine without the frustrations due to inadequate training in the basic medical sciences.

Eligibility

Applicants must meet the requirements for admission to both the Medical School, as a candidate for the M.D. degree, and the Graduate School of Arts and Sciences, as a candidate for the Ph.D. degree. It is anticipated that most of the candidates will apply for admission as a first year student, but applications will be accepted from students who are in residence.

In addition to the minimum requirements established by the prior acceptance into the Medical School and the Graduate School, additional course work in science and mathematics as well as previous research experience will count heavily in the selection of candidates.

Financial Support

Those students accepted will be offered a traineeship award (MSP trainee) which will include a stipend plus a full tuition allowance. The stipend levels are equivalent to the current U.S. Pubic Health Service predoctoral and postdoctoral fellowships, and an MSP trainee will be supported until he has completed both degrees, as long as his progress is satisfactory. These stipends include a dependency allowance of \$500.00 per dependent. The stipend levels for a seven-year program begin at \$2,400.00 with yearly increments to \$6,000.00 per year, plus any dependency allowance.

Candidates may also participate as students in the Medical Scientist Training Program without receiving one of the special traineeship awards. Details of the alternate awards will be discussed with candidates on an individual basis.

The Training Program

This program has been designed to offer the student great latitude in the selection of his course material, but the basic requirements will be those described in the following example of a typical program. In a typical program, the first two academic years are the core basic science year and the core clinical science year of the new curriculum for medical students at Duke University. At the completion of the second year, the student enters the graduate program. Following the completion of the requirements for the Ph.D., the student needs one more academic year of clinical training to complete the requirements for the M.D. degree.

Year 1—Core Basic Science Year. This year is made up of core material in the basic sciences of Anatomy, Biochemistry, Genetics, Microbiology, Pathology, Pharmacology, and Physiology, in addition to an introduction to clinical methods. The students in the Medical Scientist Training Program will work together throughout this first year and will have an opportunity to work closely with one another as well as with the advisors assigned to this group. At the end of this first year, the student will be familiar with each of the basic sciences and will be in a good position to select his field of graduate study. The summer following the first year can be used in one of two ways: one, the student may spend this time taking additional background courses in mathematics, chemistry, or other fundamental sciences; or two, he may elect to begin his graduate study and/or research.

Year 2—Core Clinical Science Year. A comprehensive approach to medicine, oriented to the patient as a whole, will be the basis for the second year curriculum for the medical scientist. During this year, which represents the student's first introduction to clinical medicine, the focus will be upon the total human biological unit rather than upon separate organ systems. The curriculum will be "vertically" integrated, multidisciplinary, and interdepartmental. Stress will be placed upon the continuity of biological processes—from conception through birth, development, and maturation to senescence and death. Special consideration will be given to the pattern of this developmental sequence in the individual, and to the changes in the pattern determined by genetic composition and by alterations brought about through the action of the particular

environment in which the patient lives.

During this year the trainee will be primarily taught by one specific group of teacher-investigators from the clinical departments. The program will consist of a special series of seminars and demonstrations plus clinical experience. The clinical experience will parallel the seminar series insofar as possible. For convenience in description, these clinical experiences have been roughly divided into periods. In practice, the entire year will be organized as a unit both in the seminar and the clinical

The initial six weeks will be devoted to Obstetrics and Gynecology, with its considerations of the adult woman, sterility and infertility, conception, maternity, and birth. Two weeks will then be given to a combined interdisciplinary effort between the Departments of Pediatrics and Obstetrics in the area of maternal fetal interaction, birth, and the perinatal period.

The next six weeks will be devoted to Pediatrics, with emphasis upon normal development and the aberrations caused by disease. Time will then be allotted to a combined effort of all departments in the area of adolescence, including such social problems as juvenile delinquency.

Medicine, Surgery, and Psychiatry will cooperate in the teaching program during the last 21 weeks of the year. Selected patients from these services will be maintained on a "mixed" ward to facilitate and improve this phase of the student's clinical experience. The different types of patients also provide an excellent opportunity for psychologists, social workers, and others to demonstrate the importance of their respective disciplines and attitudes for these patients. Finally, during the terminal weeks of the year, the student will be given the opportunity to appreciate the problems of senescence and the impact of chronic disease upon the individual and his family.

Years 3, 4, and 5-The Graduate Years. During the third, fourth, fifth, and, if necessary, the sixth year of the Program, the student will pursue graduate study in order to satisfy the requirements for the Ph.D. degree. These requirements include: (1) completion of the necessary coursework, (2) adequate performance in the preliminary examination, (3) original research suitable for a dissertation, and (4) successful defense of the thesis in the final examination. Detailed description of other general requirements for the Ph.D. degree (e.g. competence in two foreign languages) are set forth in the Bulletin of the Graduate School of Arts and Sciences. The standards of performance during this period will be

concerning the individual departments may be obtained by writing to the Director of Graduate Studies in a given department.

The graduate curriculum of each student will be worked out in consultation with the Director of Graduate Studies of the department in which the student chooses to work and will require the approval of the

determined by the individual departments concerned. Further details

Medical Scientist Training Committee. Since most of the ordering ideas and experimental techniques of all of the medical sciences derive from mathematics and the physical sciences, it is essential to ensure that all students in the program have an adequate grounding in these subjects. Because of the close working relationship and geographical proximity of the medical sciences and physical sciences departments at Duke, the setting is unusually favorable for the achievement of that goal.

If the student has not completed a study of differential and integral calculus, including one course in differential equations, he will be required to do so early in his graduate career. This also holds for students who have not had a rigorous course in Physical Chemistry. In addition to the aforesaid courses which are recommended for all students in the Program, selected students, depending upon their interests and talents, will be encouraged to take additional course work in the Departments of

Mathematics, Physics, Chemistry, and Electrical Engineering.

Descriptions of graduate courses in the Departments of Anatomy, Pathology, Microbiology, Biochemistry-Genetics, and Physiology-Pharmacology are listed in the Bulletin of the Graduate School of Arts and Sciences. Students will be encouraged to select courses which are relevant to their own developing individual interests rather than according to a prescribed program which is applied to all students in a given discipline. It is our view that such range, flexibility, and freedom are the

essence of graduate education.

The original research and dissertation of each student will be supervised by a faculty advisor chosen by the student in consultation with the director of graduate studies in his department. It is not required that the faculty advisor be a member of the department in which the student will take his degree. For example, a student in the Department of Biochemistry could choose an advisor in the Department of Microbiology; a student in the Department of Physiology, an advisor in the Department of Zoology, and so on, provided that the plan meets with the approval of all concerned. The faculty advisor is the chairman of the student's supervisory committee which must consist of at least three members of the major department. This committee generally administers preliminary (before commencing original research) and final (after completion of dissertation) examinations for the student.

Terminal Year-An Elective Year in Clinical Science. The student will be assigned an advisor from the clinical department in which he is most interested. Together they would construct a highly individualized training plan for that particular student and one that would have a major emphasis relative to the chosen clinical area as well as a minor emphasis in one other field. The integration of research and clinical experience will be carried out in such a way that the student's research competence will be facilitated rather than lost. Therefore, this year will be planned with due regard to the trainee's proposed career in research. This year would give

the trainees in the Medical Scientist Training Program further training in clinical medicine and would complement the second or core clinical year, so that the trainee's total clinical experience would approximate that now given in the regular clinical years of medical school (the third and fourth years in the majority of schools). It should be noted that since these students will receive the M.D. degree upon completion of this final year. great care will be taken by the faculty to insure that the student will be

well grounded in the present day concepts of patient care.

Parenthetically, it is hoped that the student's last year would give the student an experience which will not be repeated later during his internship. Rather it should serve to complement these phases of his training. Ideally, the future surgeon, for example, should be exposed to fields other than surgery, since he will receive intensive training in surgery during his residency. The student usually will be tempted to enter immediately upon the area of his primary interest (e.g. surgery). It is partially to offset this tendency that it is stipulated that a student should take a major and minor subject and that the final-year program should be arranged through consultation by the student with his faculty advisor.

Application and Admission Procedures

- 1. Complete the application form for the Duke University School of Medicine.
- 2. Complete the application form for the Medical Scientist Training Program.
- 3. After preliminary screening, selected candidates will be asked to submit an application to the Graduate School of Duke University.
- 4. A member of the Medical Scientist Training Committee will be available to furnish further information to applicants interviewed at Duke. Applicants will be notified of their status not later than January 10.

Further information can be obtained by writing to: Associate Director, Medical Scientist Training Program, Department of Biochemistry, Box 3711, Duke University Medical Center, Durham, North Carolina 27706.



Resources for Study

Medical Center Library

The Medical Center Library, located in the Davison Building, attempts to provide all services and collections necessary to further educational, research, and clinical activities in the medical field. Extensive reference and bibliographical services are provided. The collection exceeds 75,000 volumes and 1,500 current periodicals are being received, and over one hundred are in duplicate subscriptions.

The Trent Collection in the history of medicine is an unusually fine one, rich in manuscripts and rare books, and providing opportunity for study and research as well as casual reading in the field. Director G. Cavanagh; P. Karcz, C. McDaniel, W. Bird, M. Brown, R. Harris, N. Warren, K.

Thompson

Duke Hospital

Duke Hospital is an integral part of the Medical Center and currently has 650 beds and 30 bassinets. The hospital performs the dual functions of professional education and patient care. Comprehensive diagnostic and treatment facilities are provided. Different levels of patient care are provided, ranging from the intensive nursing unit, through the conventional nursing sections to a minimal care unit. Private, semiprivate, and

ward accommodations are available. Over 20,000 patients are admitted each year. The approximate daily census by service is as follows: Surgery, including the surgical subspecialties, 250; Medicine, 160; Pediatrics, 55; Psychiatry, 45; and Obstetrics-Gynecology, 45. Surgical facilities include 18 operating rooms where over 15,000 surgical procedures are performed annually. Two obstetrical delivery rooms are maintained. Special diagnostic and treatment units are also available such as the recovery room, cardiac catheterization laboratory, and hyperbaric oxygenation chamber.

The outpatient services comprise the public clinics, the private patient clinics, the employee health office, and the emergency service. Over 230,000 visits are made each year to these units. Close working relationships between Duke Hospital and various outside health agencies

enhance continued care of the patients.

The clinical faculty of the Duke University School of Medicine forms the medical staff of Duke Hospital. Thus, this group not only participates in both undergraduate and graduate medical education but also in active medical practice within the hospital and the private diagnostic clinics. Duke Hospital is approved for internship and residency training by the Council on Medical Education and Hospitals of the American Medical Association and conducts an active educational program involving approximately 300 housestaff members. The hospital is fully accredited by the Joint Commission on Accreditation of Hospitals.

Veterans Hospital

The Durham Veterans Administration Hospital is located within walking distance of the School of Medicine. The full-time professional staff are all members of the faculty of Duke University School of Medicine. This 489 bed general hospital provides an opportunity for closely integrated student teaching and housestaff training.

Teaching and Research Facilities

Classroom and laboratories for clinical teaching are located throughout the Duke Hospital patient areas. The major preclinical teaching facilities are in the Medical School Unit, the Davison Building, which is physically a part of the hospital. Additional teaching and research facilities are located in the Diagnostic and Treatment Building, the Gerontology Building, the Clinical Research Building, and the William B. Bell Research Building. All except the latter are a part of a single building complex.



Audiovisual Education

The Division of Audiovisual Education is structured to serve the Medical Center in three ways: 1) to produce all types of audiovisual materials; 2) to inform the faculty and students concerning audiovisual materials and methods; and 3) to provide indirect and direct assistance to the faculty who wish to use audiovisual media in their teaching, research, and patient care endeavors. There are three subdivisions: the Medical Art Facility, the Medical Photography Facility, and the Central Television Facility.

The Medical Art Facility provides illustrations produced by various art methods and techniques of subjects seen or unseen and theoretical. Services rendered include: medical illustrations, schematic and mechanical drawings, diagrams, charts, graphs, designs, lettering, signs, casts, models and exhibits, and other forms of illustrations. The production of facial prostheses and instruction in the use of opaque cosmetics are performed by the Facial Prosthetics Laboratory, a subsection of Medical Art.

The Medical Photography Facility is staffed and equipped to provide all photographs needed for teaching, in research, and in the diagnosis

and treatment of patients. For example, photographs of patients may include such fine details as the patterns of vessels on the retinae, or those of the skin as they are revealed by infrared light. Photographs are used by the medical staff as records of the patients' responses to treatment, as well as in teaching. Surgical and other procedures are recorded in motion pictures to be used for instruction and to enhance the patient record.

The Central Television Facility provides service directed toward the instruction, research, and patient care programs of the Medical Center. The television system is designed to enhance the multimedia approach for instruction. During the past several years, a collection of videotaped material has been produced as cores for teaching presentations. The television control center is capable of interdigitation of all audio and video signals originating from TV cameras, a motion picture-opaqueslide pick-up device, and video tape recorders. Studio and mobile cameras, monitors, and the wide-screen TV projector may be used in twenty-five specific locations throughout the Medical Center. These locations include all major classrooms and student laboratories.

Although no formalized study in medical art, medical photography, and medical television is provided, individual training programs are available for those who wish to pursue a career in the medical audio-

visual field. Director S. Agnello, E. Clark, W. Williams



Student Life

Living Accommodations

Housing

Men enrolled in the School of Medicine may apply for room accommodations in the Graduate Center, which is located within a block

of the Medical Center. The rooms are furnished for two persons.

Women enrolled in the School of Medicine may apply for accommodations in the women's section of the Graduate Center or space in Town House Apartments located on Swift Avenue near West Campus. Rooms in the Graduate Center are furnished for two persons. Each air conditioned apartment in Town House is furnished for three persons and includes a double bedroom, single bedroom, living room, completely equipped kitchen and one and one half baths. Heat, electricity, and water are included in the rental consideration.

Married medical students may apply for accommodations in the Duke University Apartments. These consist of efficiency, one- and two-bedroom apartments which are available to married graduate students. The apartments are complete with basic furnishings. Heat, electricity (except for window fans and air conditioners), hot and cold water, garbage and trash collection, and maintenance of grounds are included in the rental charge. (See section on Housing in chapter "Financial Information" for further information.)

Applications

Students officially accepted for admission to the School of Medicine will be requested to complete a housing information form to be returned to the Director of Admissions, Duke University School of Medicine, Durham, North Carolina.

On receipt of the completed forms, students will be sent appropriate literature, housing application forms, and detailed instructions. The completed housing application forms and required \$25.00 deposits must then be sent to the Director of Housing, Duke University, Durham, North Carolina.

Confirmation of room and apartment assignments will be forwarded to the applicants on or before August 1. (See section on Housing Deposit and Refund in chapter "Financial Information.")

Residence Hall and Town House Apartment Regulations

Rooms and apartments are rented for the academic year. Room and apartment rentals for less than one term require special arrangements.

A resident student in order to retain his room or apartment for the succeeding academic year must make application at the Office of the Housing Bureau for confirmation of his reservation.

No refund of room or apartment rent will be made after the day of registration, except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule.

The authorities of the University do not assume responsibility for persons selected as roommates, and each student is urged to select his roommate when reserving a room or apartment. Any student who occupies a double room without a roommate will be given written notice from the Housing Bureau to obtain a roommate or he may be required to pay the rental consideration for the whole room or apartments. Similar notification will be sent to occupants of apartments where vacancies

Any exchange of rooms or apartments must be made at the Housing Bureau. Persons who exchange rooms or apartments without the approval of the Housing Bureau will be subject to the charge for both rooms or apartment space.

Regulations governing the occupancy of rooms or apartments will be supplied by the Housing Bureau to those students who make application for housing. Occupants are expected to abide by these regulations.

Duke University Apartment Regulations

The Duke University Apartments are rented on a lease basis for specific periods. Policies for assignment, details of facilities provided, and other pertinent information concerning the apartments will be sent to each applicant who indicates a desire for an apartment.

Dining Facilities

Several dining facilities, located near the medical center, are available to students in the School of Medicine.

In the Duke University Union Building, there are three cafeterias offering multiple-choice menus and a dining area, the Oak Room, which offers full meals and á la carte items.

In the Men's Graduate Center, there is another cafeteria with multiplechoice menus and the Coffee Lounge, where sodas and sandwiches are served from 11:30 A.M. to 11:00 P.M. (See section on Dining Facilities in chapter "Financial Information" for approximate food costs.)

Services Available

Student Advisory Program

The development of an informal and cordial student-faculty relationship is an important objective of the Duke University School of Medicine. As a means of achieving this objective, the Student Advisory Program was established.

The Student Advisory Program provides each medical student, from the time he enters as a freshman until the time he graduates as a physician, with a single faculty member whose special interest he becomes. Each student joins with four others in constituting a group for which their faculty advisor has responsibility.

Through informal meetings, discussions, and occasional social gatherings, an atmosphere of mutual confidence and friendliness becomes established, a relationship that often extends beyond graduation and reaches far into the future.

Student Medical Care

With the exceptions to be noted, full medical and surgical care is furnished to all regularly matriculated medical students of the University while they are on the University campus if they have paid the quarterly general fee. This service is under the direction of the physicianin-charge with the cooperation of the staff of the Duke University Medical Center. It includes hospitalization (limited to thirty days), medical and surgical care, drugs, dressings, x-ray studies, and ward but not special nursing. A charge for board is made at the same rate as in the University dining halls. Refraction of eyes and treatment of teeth

and of all chronic and pre-existing conditions, such as diseased tonsils, hernia, elective surgery, chronic skin conditions, and endocrine disturbances, or accidents or illnesses occurring during vacations or while off the campus are not included in this service. The cost of any necessary braces and orthopaedic appliances, as well as of special nursing, must be borne by the patient. If the student has insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of his medical care. R. Portwood, Director of Student Health

Student and Professional Organizations

Student Government Association

The Student Government Association is composed of all students working toward the degree of Doctor of Medicine awarded by Duke University. An Executive Committee comprising fifteen members is elected by the student body. The responsibilities of the SGA include orientation of the freshmen, continuation of the Big Brother Program for freshmen, publication of the yearbook for the Medical School, participation in the Davison Scholar Program, and organization of social events, as well as representation of student views and opinions on various subjects to the faculty and administration.

A major responsibility of the SGA is the preservation of the Honor Code which has been a proud tradition at Duke University School of Medicine for many years. The prevailing opinion has been that if a student cannot withstand the relatively minor stresses and temptations arising during his medical education, he could never be expected to act with integrity under the much greater demands and responsibilities of the practice of medicine. Thus, a strong honor system exists to develop and maintain honest habits while we are learning our medical habits. Each student on or before entering Duke University School of Medicine is required to sign a statement expressing his understanding and familiarity with the honor system and his willingness to abide by its provisions. The Student Government Association serves as an Honor Council to try any infringements of the Honor Code. The Dean's committee of students, faculty, and administration serves to recommend the disposition of a student found guilty by the Honor Council.

Alpha Omega Alpha

Membership in Alpha Omega Alpha is the highest scholastic honor that a medical student can achieve. Its roster of membership consists chiefly of those who, during their period of fundamental training, have attained the highest grade of scholarship in their respective classes and whose character and professional promise at the time of graduation make their teachers and fellow students confident of their future careers in the field of medicine.

The Christian Medical Society

The Christian Medical Society is an organization of students, interns, residents, and faculty members who recognize the importance of the spiritual as well as the physical aspect of the patient and have banded together in bi-monthly meetings to emphasize the importance of combining these elements for the excellence of medical practice. The moral and spiritual responsibilities of the physician are challenged by small devotional groups and the variety of outside visiting speakers of the organization. Emphasis is placed on high scholarly standards as well as personal spiritual life. Such topics as "The Implication of the New Sex Morality," "Medical Case Studies Requiring Ethical Decisions," "The Doctor as a Counselor," and "Christian Implications of Recent Trends in American Medicine" maintain a highly sensitive spirtual physician and defend against mediocrity in medicine.

Duke SAMA Chapter

Representing 75 per cent of the medical student body, the Duke Chapter of the Student American Medical Association is a service organization interested in a wide spectrum of activities. The Student American Medical Association is a national organization which represents the opinions and desires of the future physicians of America.

The organization has earned a reputation for its interest in medical recruitment in conjunction with the Admissions Committee, a summer externship program, a directory of the medical center, a listing of research opportunities for medical students, and many other service projects. The Duke Chapter has been very active in the national organization.

The Engel Society

The Engel Society is an organization composed of a small group of medical students and faculty which has as its principal objective the promotion of the exchange of ideas and experiences between students and faculty. The Society is named for the late Dr. Frank L. Engel, who devoted much of his professional life to teaching and to helping medical students at Duke find their own niche in professional life. Six dinner meetings are held each academic year. These meetings provide a forum for informal discussion and an opportunity for the members to hear papers presented on topics of general interest to those in the medical profession. The student membership consists of six members of the

junior and six members of the senior medical classes. Each year six members of the rising junior class are invited to replace the six graduating seniors. Students are chosen for membership who possess not only the capability but the desire for scholarship in medicine in its broadest sense.

Duke University Medical Alumni

The Duke Medical Alumni now number over 4,600. Membership includes all graduates of the Medical School (total through 1965 was 2,327), past and present faculty, and all past and present house-officers of Duke Hospital, including the 2,298 who are not Duke graduates, which makes a grand total of 4,625. Associate membership is held by alumni of the following: Hospital Administration, Dietetics, Social Service, Laboratory Technique, X-Ray Technology, Physical and Occupational Therapy, Medical Record Library, and Medical Art and Illustration.

Officers

Dr. Frank Chunn '36, President (Tampa, Fla.)

Dr. John Yarborough '44, Vice President (Maryville, Tenn.) Dr. Talmage L. Peele '34, Secretary (Duke Medical Center)

Dr. George J. Baylin '37, Treasurer (Duke Medical Center)





A newsletter is sent to all the members in January, April, July, and October of each year. Reunions are held every year in Durham; the next is planned for 1967. Alumni groups have been formed in several states. Alumni luncheons or dinners are held during the following meetings: The American Medical Association, The Southern Medical Association, The North Carolina Medical Society, and the American Academy of Pediatrics.

The map shows states in which Duke Medical Alumni are located and the number in each state. Figures include those who received the M.D. degree from Duke and also those who have served a year or more on the housestaff. A total of 4,367 physicians are distributed throughout the United States.

There are also 197 Duke Medical Alumni serving in the territories of the United States and in foreign countries, and 53 alumni are on duty in the Armed Forces overseas. The countries and territories in which they are located are as follows: Afghanistan, one; Australia, one; Belgium, three; Brazil, eight; Canada, thirty-three; Caribbean, twelve; Chile, eight; China, two; Colombia, nine; Egypt, one; Ethiopia, one; Formosa, eight; France, three; Germany, two; Greece, one; Guatemala, five; Iceland, three; India, five; Indonesia, one; Iran, three; Iraq, one; Ireland, one; Italy, two; Japan, twenty; Jordan, two; Kenya, one; Korea, four; Lagos, one; Mexico, seven; Norway, two; Pacific Islands, one; Panama, one; Paraguay, one; Peru, two; Philippine Islands, nine; South Africa, two; Sweden, one; Switzerland, two; Thailand, six; United Kingdom, twenty-two; and Venezuela, five.

Financial Information

Fees and Expenses

Tuition and Fees

Listed below is a table of the approximate expenses for the normal academic year of the School of Medicine:

Tuition and fees		.\$1612.00
Board		. 600.00
Room		. 320.00
Books		. 135.00
Laundry		. 100.00
Personal Expenses		. 300.00
Student Government Subscription*		. 10.00
Instruments and insurance ***		. 160.00
	Total	\$3237.00

A pro-rata part of the total fees is payable by the Friday preceding each applicable term. A fine of \$5.00 is charged for late registration after this time. No credit will be given for any term in which the tuition has not been paid, whether the work has been done here or elsewhere.

*Payable by all students.

^{**}Microscope, sphygmomanometer, ophthalmoscope, otoscope, and other equipment which are required of each student and which must conform to rigid standards may be purchased from the University by means of a Student Equipment Time Payment Plan.

A student is not eligible to attend classes or to make use of University facilities if he is in default of payment of monies owed to the University.

Bills for fees and tuition are rendered by the Office of the Bursar, Duke University. However, nonreceipt of a bill does not exonerate the student from payment or from assessment of fine for late registration.

It is not advisable for students to attempt outside work to defray their

expenses during the academic year.*

Living Accommodations

Housing

Men enrolled in the School of Medicine may apply for room accommodations in the Graduate Center, which is located within a block of the Medical Center. The rooms are furnished for two persons. The rental charge per person for a double room is \$320.00 for the academic year, or \$160.00 for the 18-week term, or \$80.00 for the 9-week term, or \$64.00 for the 7-week term.

Male applicants may apply for single rooms, and these will be assigned if available; however, single rooms are usually reserved by present oc-

cupants returning for succeeding academic years.

Women enrolled in the School of Medicine may apply for double room accommodations in the women's section of the Graduate Center. The rental charge for each student in a double room is \$320 for the academic year, \$160.00 for the 18-week term, or \$80.00 for the nine week term, or \$64.00 for the seven-week term.

No single rooms are available for initial assignment to women ap-

plicants.

Women enrolled in the School of Medicine may apply for assignment to Town House Apartments, where three women students are assigned to each apartment. No effort is made by the Director of Housing to assign specific bed space within each apartment. The Director of Housing strives to assign three students with similar backgrounds and mutual academic interests to each apartment. Mutual requests to share an apartment will be honored. The rental charge for a medical student is \$460.00 per academic year, or \$230.00 for each 18 week medical term. Assignment to apartments for shorter periods may be arranged with the Director of Housing.

Married medical students may apply for accommodations in the Duke University Apartments. These consist of efficiency, one- and two-bedroom apartments which are available to married graduate students. The twobedroom apartments are assigned on a priority basis to couples with two children. The apartments are complete with basic furnishings. Heat,

*Wives of medical students desiring employment may secure information from the Duke Medical Center Personnel Office or the Duke University Personnel Office. electricity (except for window fans and air conditioners), hot and cold water, garbage and trash collection, and maintenance of grounds are included in the rental charge. Rental charges per month are \$70.00 for the efficiency apartments, \$90.00 for the one-bedroom, and \$110.00 for the two-bedroom. For further information on the Duke University Apartments, write to the Housing Bureau, Duke Station, Durham, North Carolina.

Housing Deposit and Refund. A \$25.00 deposit is required of each applicant before a housing reservation is made. This initial deposit serves as a continuing deposit for successive terms.

Refunds. The room deposit will be refunded under the following condi-

tions:

1. Within thirty days after the student has been graduated.

2. Upon withdrawal from the University residence halls by students enrolled on the semester basis, provided written notice is received by the Director of Housing by August 1, for cancellation of a reservation for the fall semester, and not later than January 15, for cancellation of a

reservation for the spring semester.

3. Upon withdrawal from the University residence halls by students enrolled on the basis of the medical term, provided written notice is received by the Director of Housing by August 1, for cancellation of a reservation for the term beginning in September, and not later than ten (10) days prior to the beginning of any subsequent medical term within the academic year.

The deposit required for Duke University Apartments is refunded under similar circumstances; however, apartments are rented on a lease basis.

No refund will be made until the occupant has checked out of his room or apartment through the Director of Housing and has settled his account with the Bursar.

Dining Facilities

If a student dines on the Duke University campuses, the cost of food for the academic year ranges from \$450.00 upward, depending upon the individual.

The prices of food are the same in each of the University-operated dining facilities.

Motor Vehicle Registration

Each motor vehicle operated on the Duke University campuses by students enrolled in the School of Medicine must be registered at o8 Social Science Building within five calendar days after operation on the campuses begins, and thereafter must display the proper registration emblem.

Resident students are required to pay an annual parking fee of \$30.00 for each motor vehicle, excepting that a parking fee of \$10.00 is required for each motorcycle, motorbike, or motor scooter.

To register a vehicle, the student must present the following docu-

ments:

- 1. State vehicle registration certificate.
- 2. Valid driver's license.
- 3. Satisfactory evidence of automobile liability insurance as required by North Carolina law—\$5,000 per person, \$10,000 per accident for personal injuries, and \$5,000 property damage.

Parking, traffic, and safety regulations will be given each student who registers his vehicle. Students are expected to abide by these regulations.

Financial Aid

With the increasing cost of medical education, the need has also increased for financial assistance to deserving students. Three kinds of aid are currently available: scholarships or fellowships, loans, and cash awards. Where not stated, information concerning these may be secured from the Office of the Dean.

Scholarships—Fellowships

The Mary Duke Biddle Foundation Scholarships are awarded to academically distinguished medical students to assist them while they are in financial need. A scholarship may cover as much as the cost of tuition at Duke University School of Medicine during the period of an award.

The Thomas C. Bost Foundation Scholarships are available each year in amounts equal to the tuition charge. These awards are assigned on

the basis of merit and need.

The Sue Eggleston Woodward Memorial Fund Scholarships are assigned to women students on the basis of merit and need. One award is currently available each year in the amount of \$500.

The Charles Alva Strickland Memorial Fund Scholarships may cover up to full tuition costs. This scholarship may be renewed for each year after the first year. Merit and need are taken into consideration.

The Dr. Hillory M. Wilder Scholarship Fund covers full tuition for each

of four years and is awarded on the basis of merit and need.

The Pfizer Scholarship offered by Pfizer Laboratories, a division of Charles Pfizer & Co., Inc., is an award of \$1,000 granted to a student selected on the basis of merit and need.

The Wilburt C. Davison Scholarship was instituted to enable a medical student to widen his experience by clinical study outside of the United States. One award of \$500.00 is made each year. Information may be obtained from the Assistant Dean for Medical Student Affairs.

Student Research Fellowships are available as part of an extensive program designed to encourage the medical student to participate in research. Summer Fellowships carry a stipend of \$200.00 per month. These Fellowships enable selected students, after completion of their first year, to participate in research during a summer vacation or other free time. Special Fellowships in Nutrition, Ophthalmology, Allergy, and other fields are also available. Opportunities also exist for a student to engage in research for an entire year during which time he temporarily discontinues his medical course. These Post-Sophomore Research Fellowships carry a stipend of \$3,200 per year plus an allowance for dependents and tuition expenses. In special circumstances these Fellowships are tenable at institutions other than Duke Medical Center and outside the United States. Information may be obtained from the Assistant Dean for Medical Student Affairs

Awards

The Borden Undergraduate Research Award in Medicine. This is an award of \$500.00 to be given to the Duke senior who, on the recommendation of the Award Committee, has performed the best research work during his or her entire medical course, including that done during the preclinical years. Applicants should submit their papers, articles, or reprints to the Dean at least three months prior to expected date of graduation.

The Trent Prize in the History of Medicine. The Trent Prize was established by Mrs. Mary Trent Semans in memory of the late Dr. Josiah C. Trent to encourage students to undertake independent work in the history of medicine and to utilize the resources of the Trent Collection.

An annual award of \$100.00 is offered for the best essay by a Duke medical student on any topic in the history of medical and allied sciences. An additional book award will be made to each entry of merit. Students are invited to discuss possible topics with the Curators of the Trent Collection. Finished papers must be submitted to Mr. G. S. T. Cavanagh, Medical Center Library, by October 31 of each year.

Lange Medical Publications Awards. Textbooks and certificates are awarded to the Senior Class Valedictorian and the top ranking woman graduate. Textbooks are also awarded to the top two students in each of the upper three classes and to the president and representatives of the first year class.

C. V. Mosby Awards. Gift certificates for the purchase of books are

awarded annually to five top students in the graduating class.

American Medical Women's Association Awards. An award of \$100.00 and a citation are presented to the woman medical student who graduates at the top of her class. An Honorable Mention citation is presented to all women students who graduate within the top ten per cent of their class.

Smith Kline & French Award for Medical Writing. An award of \$100.00 is made annually to the medical student who submits the most meritorious essay describing a piece of research. The paper must show that particular attention has been given to clarity of writing, definition of objectives, presentation of results, and bibliography in correct form. Papers must be submitted to the Asistant Dean for Medical Student Affairs before November 30 of each year.

Merck Manual Awards. A copy of the Merck Manual is presented annually to past presidents of the Student Government Association and the Duke Chapter of the Student American Medical Association to recognize their contribution to the life of medical students at Duke University

School of Medicine.

Roche Award. A gold engraved wrist watch and certificate is presented annually to the graduating senior who has achieved the highest academic performance throughout four years of medical school at Duke University School of Medicine.

Roche Medical Book Program. Each member of the senior class is sent a certificate that permits him to receive a medical textbook of his selection.

Duke University School of Medicine Awards. The past presidents of the Student Government Association and the Duke Chapter of the Student American Medical Association receive a book award in recognition of their contributions to student life.

The "Thomas Jefferson" Award. This award is made periodically to recognize outstanding achievement in fields outside those of medicine and science. The purpose is to identify individuals who have a broad range of talents and who have contributed materially to the life of the University as a whole.

The Frank L. Engel Scholarship in Endocrinology. A pecuniary award and a certificate is made annually to the student who has conducted the most meritorious research in the field of Endocrinology. The award commemorates the contribution of a former faculty member, Dr. Frank L. Engel, whose life was dedicated to research in endocrinology, teaching, and the care of patients.

The Upjohn Award in Community Medicine. This is an award of \$200.00 given to a Duke student for the best essay discussing some aspect of the social, cultural, economic, and other parameters of health. The paper should incorporate personal experiences. There is no limitation on length. Applicants should submit their papers by November 30 of each year to Dr. William DeMaria or Dr. E. Croft Long.

Loans

Loan funds are administered in accordance with the following regu-

1. Loans will be made only to students who are taking full courses of study that lead to a degree. All loans except those from the Swett Funds

must be arranged not later than July 1 of each year.

2. Every applicant for a loan must present with the application such security as the President of the University may approve, and no money will be advanced before a note with approved security is in the hands of the Treasurer of the University.

The Angier B. Duke Memorial Fund covers amounts up to full tuition

for each of four years.

The W. K. Kellogg Foundation Funds are available for amounts up to

full tuition for each of four years.

The Francis and Elizabeth Swett Funds are immediately available to students with emergency need. These loans are usually small and on a short-term basis.

The James L. Clark Memorial Fund provides financial aid to needy

students who are outstanding in merit and dedication.

North Carolina State Loans are available to worthy students who agree, upon completion of the required training, to practice in North Carolina in certain designated areas a full calendar year for each academic year or fraction thereof that a loan is received. To be eligible a student must have been a resident of North Carolina at least six months immediately preceding initial matriculation in a course of study. The maximum loan to a medical student is \$2,000.00 per academic year (\$8,000.00 for a four year period). The student who receives a loan may, following completion of the four year medical course, complete up to three years of postgraduate training prior to commencing the practice commitment. A recipient is also eligible for deferment while on active duty in the armed services during the mandatory draft period. If the recipient is unable to practice as specified upon completion of professional training, he agrees to repay the loan on demand at 6% interest. Detailed information can be obtained from the North Carolina Medical Care Commission, Post Office Box 9594, Raleigh, North Carolina 27603.

Health Professions Student Loan Fund was created by federal legislation and funds have been allotted to Duke University School of Medicine.

Long term loans are made at favorable interest rates.

Admission

Intelligence, character, and integrity are the essential qualifications for admission.

A premedical student should be aware of the importance of a wellrounded general education as a preparation for the study of medicine and not limit himself to scientific courses. The Admissions Committee believes that the manner in which the college years are utilized is of greater importance than the specific subjects taken. The premedical student would be better advised to secure a knowledge of the principles and a thorough appreciation of the interrelations of the basic sciences than to accumulate credits in many courses. He should learn how to work independently, to observe critically, and to analyze rather than merely to store the information presented. Good study habits and use of time are perhaps the most important tools a student can bring to the study of medicine. His choice of studies beyond those required for admission should be governed by his own chief interests and by the intellectual stimulus to be derived from the work.

Application for Admission

Application forms may be obtained by writing to the Committee on Admissions, Box 3710, Duke Hospital, Durham, N. C. Please do not send a request before August 1. Formal applications will be accepted by the Committee on Admissions only between August 1 and December 1.

Due to the large number of qualified applicants to all medical schools, each student is urged to apply to at least four schools.

Requirements for Admission

A minimum of ninety semester hours of approved college credit is necessary for admission to the School of Medicine. These must include:

One year of college English which must consist primarily of expository English composition.

Two years of chemistry. The first year should be inorganic and the second analytic and organic.

One year of physics.

One year of biology and/or zoology.

One year of calculus.

All science requirements must be completed not more than seven years

prior to entrance.

Medical College Admission Test is required of all applicants. It is administered by the Psychological Corporation, 304 E. 45th St., New York 17, New York. This test is given at many of the colleges throughout the country in May and October of each year. Arrangements for taking this test should be made by the student through his premedical advisor.

Selection

Selection is made between September 15 and February 15 for the student entering the following September. The data on each candidate are carefully screened by the Committee on Admissions. A personal interview will be arranged for those with satisfactory credentials. If a distance from Durham is permissible the interview is conducted here; otherwise candidates are referred to our Regional Representatives. Many factors are evaluated by the Committee in the selection process. Those students who show the most promise for exceptional performance in their future practice of medicine are admitted. The candidate is notified as soon as possible whether or not he has been accepted. If he has been accepted, it is necessary for him to send a deposit of \$50 by the succeeding January 15 in order to insure enrollment. This deposit is applied toward tuition and is refundable upon withdrawal prior to January 15. Inasmuch as admission must be offered a considerable period in advance of matriculation, the admission must be provisional upon the successful completion of the remaining college work. In addition, a physical examination is necessary prior to enrollment.

Advanced Standing

Applicants who have completed two years in most of the United States and Canadian schools will be considered for transfer only as space permits. Such transfer students would be required to complete the second and fourth year of our curriculum. For transfer, successful completion of Part I of the National Board Examination is required as evidence of satisfactory accomplishment in the subjects taught in the first two years of most North American schools.

A limited number of transfer students from foreign medical schools may be admitted each year. Such students should have completed their preclinical training and will be required to take Part I of the National Board Examination. If space permits, these students will be admitted to our sophomore clinical rotation and be required to complete the junior and senior years composed of electives in the clinical and preclinical areas. By attending two summer sessions a transfer student from a foreign medical school can earn his M.D. degree from Duke University approximately two and one half years after matriculation.

Students who have successfully completed the Ph.D. in the biomedical or preclinical sciences may apply for a three year program leading to the M.D. degree, consisting of the freshman "core" year followed by the sophomore clinical rotation and the senior clinical electives. Advanced standing for the courses given during the freshman year must be negotiated with the individual department chairman following accep-

tance.

Transcripts

A student who wishes to transfer his credits to another institution should direct his request to the Recorder, Duke University School of Medicine. Transcripts are furnished without charge.

Summary for Applicants

Years of College work required	3
Tuition and fees for first year	\$1612.00
Estimated cost of equipment first year	265.00
Estimated room and board	920.00
Nonrefundable application fee	10.00
Deposit required on or before January 15, 1968,	50.00
from accepted applicant	_
Medical College Admission Test required	Yes
Size of 1967-68 first year class	85

File application for admission between

Notification of action on application between

Date entering class starts school

August 1, 1967 December 1, 1967 October 1, 1967 February 15, 1968 September 3, 1968

Regional Representatives of the Committee on Admissions

Alabama: Birmingham, Sam E. Upchurch

Alaska: Anchorage, Milo H. Fritz Arizona: Phoenix, Stanley Karansky

Arkansas: Little Rock, Rosalind Smith Abernathy

California: Berkeley, H. I. Harvey; Los Angeles, Joseph A. Conroy, Jeremiah W. Kerner; Menlo Park, Gustave Freeman; Palo Alto, James B. Golden; Pasadena, Robert H. Pudenz; San Francisco, John E. Cann; San Mateo, Lester H. Margolis

Canada: Montreal, J. E. Gibbons; Toronto, John B. Armstrong

Colorado: Colorado Springs, Donald D. Borders; Denver, F. Vernon

Altvater, H. T. Horsley, Jr., Ray Pryor Connecticut: *Hartford*, William H. Glass; *New Haven*, Clarence D. Davis, Saul A. Frankel, Joseph Mignone, Ned M. Shutkin; Old Saybrook, John R. Egan District of Columbia, Louis Spekter

Florida: Gainesville, Lamar Roberts; Lakeland, Charles Larsen, Jr.; Miami, James J. Hutson; St. Petersburg, David S. Hubbell; Tampa, Richard G. Connar

Georgia: Atlanta, E. B. Dunlap, Jr.

Hawaii: Honolulu, James G. Harrison, Jr.

Idaho: Boise, William L. Venning; Idaho Falls, Reid H. Anderson

Illinois: Chicago, George H. Gardner, Daniel J. Pachman, E. Clinton Texter, Jr.; Evanston, Donald R. Mundie, Milton Weinberg, Jr.; Monmouth, Kenneth E. Ambrose

Indiana: Indianapolis, Stuart O. Bondurant, John D. Graham, Joseph C. Ross

Iowa: Davenport, A. W. Boone; Des Moines, C. W. Latchem; Iowa City, Arthur L. Benton

Kansas: Kansas City, Ralph H. Major; Wichita, Thomas Jager

Kentucky: Lexington, Kearns R. Thompson; Louisville, George Uhde Louisiana: New Orleans, Richard H. Corales, Jr., Harold M. Horack, Philip H. Jones, Richard M. Paddison

Maine: Portland, E. Charles Kunkle

Maryland: Baltimore, John T. King, C. Edward Leach

Massachusetts: Boston, Raymond D. Adams, James H. Currens, Dorothy A. Elias, Ellison C. Pierce, Jr., James L. Tullis, R. Lewis Wright; Springfield, George A. Sotirion

Michigan: Ann Arbor, George E. Bacon, E. Richard Harrell, Muriel Meyers; Detroit, Robert F. Kandel; Port Huron, William T. Davison

Minnesota: Rochester, W. Henry Hollinshead

Missouri: Columbia, John T. Logue; Kansas City, Robert H. Barnes New Hampshire: Hanover, George Margolis, Robert J. Vanderlinde

New Jersey: Montclair, Benjamin B. Burrill

New Mexico: Albuquerque, Robert Proper; Artesia, C. Pardue Bunch New York: Albany, Frank M. Woolsey; Buffalo, Olive J. Bateman; Endicott, James K. Tompkins; Ithaca, John G. Maines, Jr.; Lockport, Frank H. Crosby; New York City, Eugene L. Horger, Julia M. Jones, Michael J. Lepore, J. William Littler, Richard A. Ruskin, Robert A. Shimm; Pittsford, Rufus S. Bynum; Syracuse, Alfred S. Berne, James

E. Sheehy

Ohio: Cincinnati, Murray B. Sheldon, Jr.; Columbus, Robert J. Atwell, Charles A. Doan, James V. Warren; Dayton, Stuart R. Ducker; Elyria, William L. Hassler; Toledo, William A. Phillips

Oklahoma: Tulsa, Gerald E. Cronk Oregon: Portland, Richard R. Carter

Pennsylvania: Bethlehem, Ralph K. Shields, James G. Whildin; Harrisburg, Alfred J. Sherman; Johnstown, W. Frederick Mayer; Philadelphia, John V. Blady, Max W. Fischbach, Alfred M. Sellers; Pittsburgh, Jack D. Myers; Scranton, Louis C. Walker; Williamsport, William R. Brink

Puerto Rico: Santurce, Kenneth B. Brown

South Carolina: Charleston, Edward F. Parker, J. I. Waring; Columbia,

Ben N. Miller; Greenville, Raymond C. Ramage

Tennessee: Chattanooga, Richard Van Fletcher; Memphis, Raphael E. Semmes; Nashville, A. Greer Ricketson; Sewanee, Henry T. Kirby-Smith

Texas: Austin, Frank Morris; Dallas, R. H. Adams, A. James Gill; Galveston, Henry L. Burks, R. H. Rigdon; Houston, H. Grant Taylor; Midland, Dorothy B. Wyvell; San Antonio, Royall M. Calder

Utah: Salt Lake City, Andrew Deiss Vermont: Burlington, Rufus C. Morrow

Virginia: Charlottesville, Henry B. Mulholland

Washington: Seattle, W. A. MacColl West Virginia: Charleston, Harold H. Kuhn

Wisconsin: La Crosse, C. Norman Shealy; Milwaukee, Jack L. Teasley

Courses of Instruction

(See listing of Faculty, Staff, and House Staff beginning on page xvi.)

Anatomy

Professor J. Robertson, *Chairman*; Professors J. Everett, J. Markee, M. Moses, T. Peele; Associate Professors R. Becker, J. Buettner-Janusch, W. Cuyler, K. Duke; Assistant Professors C. Christian, F. McFalls, M. Mahaley, J. H. Prost; Associates F. Bassett, J. Goree, R. McMasters

Instructors, M. Morgan, W. Redmond, J. Wilson

Required Course

The core course of instruction in *Human Anatomy* (200) will constitute about 253 hours during the first 18 weeks of the first year. The gross anatomy of the head, neck, and trunk will be studied during the first 11 weeks, histology during the first 13 weeks, and neuroanatomy during the 15th through 18th week. The gross anatomy of the back, pectoral and pelvic girdles, and the limbs will be studied during the 12th through 14th week. All of the above will be integrated with the other material studied during the first year. Emphasis will be placed upon the study of the material in the laboratory. In an attempt to utilize more fully the laboratory time, audiovisual education methods will be employed as fully as

possible. These techniques will consist of color motion pictures of demonstration dissections, closed-circuit television, color lantern slides, and motion pictures. All of the instruction is designed to be as informal and as nearly individual as possible. General principles and the functional viewpoint of living anatomy will be stressed in the hope that the material in the laboratory. In an attempt to utilize more fully the laborastudent may be stimulated to secure a working knowledge of anatomy in the broadest sense. Whenever possible, fresh tissues and living cells will be made available for examination. Patients exemplifying anatomical principles will be presented, some within the classroom, others over live television, and others prerecorded on videotape for later presentation at the appropriate time in the students' learning experience.

In gross anatomy all of the students will dissect the important structures in certain areas of the body; namely, within the neck, thorax, abdomen, and pelvis. In other regions the students will do little or no dissection but will instead view prosections as well as prerecorded TV programs and motion pictures. The regions that will be presented in this manner include the back, the pectoral and pelvic girdles, the limbs, and the interior of the cranium, including the gross anatomy of the ear, orbit, oral and nasal passages, and paranasal sinuses. The general principles of programmed learning will be utilized even more extensively than in the past few years.

In microscopic anatomy the students will be introduced to electronmicroscopy, polarization optical, and X-ray diffraction methods for studying problems of biological structure. The teaching will be focused on the cell, its generalized structural and functional organization to the molecular level, and its differentiation in various organs and tissues. The students will be introduced to biochemical cytology and to biophysical cytology and cytological genetics. The structure of unit membranes will be considered in detail.

In neuroanatomy the students will be introduced to neurocytology, nerve cells, and glia. The major part of the course will deal with: (a) the spinal cord, including the ascending, descending, and associative tracts; (b) the brain, brain stem, and cranial nerves 3 through 12; (c) the autonomic nervous system; (d) the cerebellum, brain stem, and reticular formation; (e) the thalamus and hypothalamus; (f) the cerebral cortex, including its structure and blood supply and primary pathways; and (g) the somatic sensory and the motor systems, as well as the visual, auditory, olfactory, and limbic systems. There will also be clinical neurology with presentations of suitable patients.

The students will spend about 111 hours in gross anatomy, about 78 hours in microscopic anatomy, and about 64 hours in neuroanatomy.

Elective Courses

Gross Anatomy

201. Anatomy Related to Locomotion. Complete dissection is performed of that part of the body concerned with locomotion and posture; namely, the back, the pectoral and pelvic girdles, and the superior and inferior extremities. Visual aids of all kinds will be used extensively. This course will be designed to meet some of the needs of Ph.D. candidates in Anatomy, as well as students interested in general practice, orthopaedics, or neurosurgery. Prerequisite: core course in Anatomy or equivalent. Third and fourth quarters. Eight hours a week. Number of students arranged by staff. (Will not be offered 1967-1968.) Drs. Markee, Everett, Becker, Duke, and Bassett

205. Anatomy of the Viscera. This is a study of the thoracic, abdominal, and pelvic organs. Emphasis will be primarily upon the anatomy of these viscera and their blood supply, innervations, and relationships. While primarily a laboratory course, the dissections will be augmented by extensive use of prosections, motion pictures, and prerecorded TV presentations. This course is designed for Ph.D. candidates in Anatomy as well as for future general practitioners and specialists in Internal Medicine. Prerequisite: core course in Anatomy. Third and fourth quarters. Five hours a week. Number of students arranged by staff. (Will not be offered 1967-1967.)

Drs. Markee, Everett, Becker, and Duke

215. Anatomy of the Interior of Cranium and Deep Face. Course will deal with: (a) the interior of the cranium and the ear, eye, and orbital contents; (b) deeper structures of the head, including the brain and its blood supply and venous drainage; (c) the nasal and oral cavities as they are related to the pharynx; and (d) paranasal sinuses. This course is designed to meet the needs of the Ph.D. candidates in Anatomy as well as the needs of general practitioners and the specialists including neurosurgeons, clinical neurologists, ophthalmologists, and otolaryngologists. The major emphasis will be on gross dissections. Visual aids of all types will be utilized extensively. Prerequisites: core course in Anatomy or the equivalent. Third and fourth quarters. Five hours a week. Number of students arranged by staff. Drs. Markee, Everett, Duke, and McFalls

approach and group of students with a special interest. For example, the heart and its anatomical characteristics and relationships or in some other region. This course will be planned for the individual needs of the group of students requesting the course. Prerequisite: core course in Anatomy or equivalent. Units of credit may vary from one to three. Third and fourth quarters. Hours by arrangement. Number of students arranged by staff. Drs. Markee, Everett, Duke, and Bassett

226. Neurocytology. The fundamental structure of neurons, nerve fibers, and other neural supporting elements will be considered. The adaptability of these structures to nerve impulse transmission, neurosecretory processes, and interneuronal relationships will be stressed. Prerequisite: Basic Neuroanatomy. Third quarter. Six hours a week. Six to ten students. Drs. Peele and McMasters

228. Neuroanatomy: Reconstruction of the Brain. This course will involve laboratory and conference work during which a reconstruction of the brain will be made according to the Hausmann kit and program. Each student will furnish his own kit and requisite atlases. These cost about \$50.00. Prerequisite: basic course in neuroanatomy. Fifth quarter. Six hours a week. Four to six students. Drs. Peele and McMasters

230. Neuroanatomy of Somatic Motor and Sensory Systems. This course will involve consideration of motor mechanisms of striated muscles, reflex, voluntary, and involuntary. Pyramidal, extrapyramidal motor systems, gamma loop, and cerebellum will be studied. Study of somatic sensory system includes peripheral receptor, spinal, thalamic and cortical levels. Prerequisite: Basic Neuroanatomy. Fourth quarter. Six hours a week. Six to ten students. Drs. Peele and McMasters

232. Neuroanatomy of the Dorsal Thalamus and Cerebral Cortex. This course includes the development of the dorsal thalamus, its chief nuclear divisions and their connections. Thalamocortical relations will be stressed. The development of the cerebral cortex, its anatomy, blood supply, and chief connections will be studied. Prerequisite: Basic Neuroanatomy. Fourth quarter. Six hours a week. Six to ten students. Drs. Peele and McMasters

234. Neuroanatomy of the Visceral Nervous System. Peripheral distribution of the autonomic nervous system and central nervous system regions concerned with visceral innervations will be studied. In addition, particular emphasis will be placed on the hypothalamus and limbic system. Prerequisite: Basic Neuroanatomy. Fifth quarter. Six hours a week. Six to ten students. Drs. Peele and McMasters

236. Neuroanatomy of Special Senses. Emphasis will be placed on the neuroanatomy of the visual and auditory systems, but gustatory and olfactory mechanisms will receive attention also. Retina, visuosensory, visuomotor, vestibular, and auditory mechanisms will be emphasized. Prerequisite: basic course in neuroanatomy. Third quarter. Six hours a week. Six to ten students. Drs. Peele and McMasters

Reproduction and Development

378. Reproduction. Lecture-laboratory course dealing with mammalian reproduction. The rat and rabbit will serve as the principal laboratory subjects. The following areas will be covered: embryology of the repro-

ductive system; gonadal structure, gametogenesis, and hormone production; structure and function of the diencephalic-pituitary system; structural, chemical, and behavioral actions of sex hormones; mechanisms of fertilization and implantation; placental structure and function; and lactation. Prerequisite: core curriculum in Anatomy and Physiology. Third and fourth quarters. Four hours a week. *Drs. Everett* (Anatomy) and Kostyo (Physiology)

207. Developmental Anatomy and Fetal Physiology. A survey of principles of mammalian morphological development from conception to birth with emphasis on selected aspects of physiological and behavioral development in utero. Prerequisite: core course in Anatomy. Third and fourth

quarters. Two hours a week. Drs. Becker and Duke

Physical Anthropology

231. Physical Anthropology. Survey of major developments of physical anthropology. Human evolution, primate phylogeny, paleontology of man and other primates, primate biochemical genetics, primate behavior, and human variation (genetic and somatic) are the principal topics of the course. Prerequisite: one course in general biology, including elementary genetics. Three units of graduate credit. Two lectures (one and a half hours each) each week. September through January. (This course is currently listed in the Bulletin of the Graduate School as Anatomy M231 and as Anthropology 231). Dr. Buettner-Janusch

238. Evolutionary Biology and Medical Science. The impact of evolutionary biology and theory on medical science and research and a survey of the basic literature in evoluntionary biology are included. Principles of taxonomy, the species concept, population structure, and population genetics are studied, as they apply to problems of medicine and medical research. Third quarter. Three hours a week. Five to thirty students.

Drs. Buettner-Janusch and Prost

Microscopic Anatomy

240. Advanced Microscopic Anatomy. Course will deal in depth with selected topics of current significance that concern the relation of structure to function in cells and tissues. Recent contributions to basic problems of ultrastructure, growth and development, endocrinological control, physiological differentiation, and evolutionary origins of functional systems (of cells, tissues, and organs) will be emphasized. Prerequisite: core course in Anatomy. Fourth quarter. Four hours a week. Drs. Robertson, Becker, Buettner-Janusch, Duke, Everett, and Moses

242. Biophysical Cytology. The structure of cells will be considered from the molecular level to the level of the whole cell. Emphasis will be on the relation of large molecules to the structural and functional organi-

zation of cells, e.g. mitoses, patterns of DNA organization in cells, contractile protein, unit membranes, and others. Prerequisite: core course

in Anatomy. Fourth quarter. Drs. Robertson and Moses

246. Tissue Culture. Course will deal with biology of cells in tissue culture. It will consider those areas in cytology that can best be approached by means of tissue culture combined with time-lapse motion picture photography. Examples are: (a) the study of cilia and photographic recording of changes in their movement after alteration in the media and (b) changes in the cell membrane including the motion picture recording of the passage of substances through the membrane. Prerequisite: core course in Anatomy. Third and fourth quarters. Six hours a week. Markee and McFalls

248. Cell Structure and Function. Includes discussions of selected problems such as chromosome structure, mitosis, and cytological aspects of inheritance and development. Prerequisite: core course in Anatomy. Third and fourth quarters. Four hours a week. Drs. Moses (Anatomy)

and Nicklas (Zoology)

250. Analytical Cytology. Course will stress the application of modern microscopic methods to the analysis of problems of cell biology, and will provide experience in techniques such as light and electron microscopy, cytochemistry, cytophotometry, polarization microscopy, interference microscopy, small and wide angle X-ray diffraction, and autoradiography. Prerequisite: core course in Anatomy. Third and fourth quarters. Six hours a week. Drs. Moses and Robertson

252. Electron Microscopy. Emphasis is on the theory, operation and use of the electron microscope and on the procedures for preparing biological materials for morphological examination and for cytochemical and autoradiographic analysis. Prerequisite: core course in Anatomy. Third and fourth quarters. Three hours a week. Drs. Moses and

Robertson

Biochemistry

Professor P. Handler, Chairman; Professors M. Bernheim, E. Davidson, S. Gross, W. Guild, R. Hill, H. Kamin, C. Tanford, R. Thiers, S. Wakil; Associate Professors W. Byrne, I. Fridovich, J. Harris, N. Kirshner, W. Lynn, K. McCarty; Assistant Professors R. Greene, K. V. Rajagopalan, T. Rosett, H. Sage, R. Wheat; Instructor R. Habig; Associates J. Joshi, Y. Nozaki

Technical Associate L. Daniels; Fellows B. Agrawal, M. Bilimoria, K. Brendel, K. Brew, G. Capp, K. Dorrington, K. Hade, J. Hijmans, V. Joshi, T. Kuwaki, B. Masters, M. Mizugaki, M. Ohkido, T. Sakurada, H. Schults-Holthausen, M. Shapiro, L. Siegel, K. Straub, J. Swanson, J. Sullivan, T. Takagi, H. Tritschler, J. Vorhaben, G. Weeks, M. Zarlengo

Required Course

The required course in Biochemistry (200) for first year students is given over a period of eighteen weeks in the first term. The first phase is devoted to a survey of the chemistry of the materials fundamental to all life proteins, fats and carbohydrates, and the nature of enzymatic action. This is followed by consideration of those events in intermediary metabolism common to the life of all mammalian cells. The special metabolism of muscle, kidney, bone, erythrocytes, liver, and connective tissue and the chemical aspects of digestion, respiration, electrolyte, acidbase, and fluid balance are presented with relation to the study of the physiology of the organs so as to facilitate integration and correlation of the two disciplines.

Elective Courses

208. Advanced Biochemical Laboratory. Course is specifically designed for third year medical students who select Biochemistry or a closely related area for specialization for the Fall quarter. The laboratory experience will emphasize modern laboratory techniques, such as radioisotope detection, chromatography, and spectrophotometry. These techniques will be illustrated by experiments from diverse areas of biochemistry such as lipid metabolism, protein biosynthesis and enzyme kinetics. Students will have the time and opportunity to modify and extend the basic formal experiments. Simultaneous registration in Biochemistry of Disease, Energy Metabolism and Seminar is highly recommended. Sixteen hours per week for 18 weeks. First and second quarters. Limited to 20 students. Drs. Lynn, Rosett, and Staff

210. Biochemistry of Disease. Course is designed for the third or fourth year medical student who is interested in the primary defect, manifestations, and diagnostic aspects of diseases of metabolic or genetic origin. Examples of emphasis would include a study of the primary defects in diabetes mellitus and other endocrine disorders, disturbances of electrolyte metabolism, genetic lipidoses, etc. Two hours per week for 18 weeks. First and second quarters. Limited to 40 students.

and Staff

212. Biochemistry-Medical Scientists Seminar. Seminar is designed for the third year medical student who selects Biochemistry for his area of specialization. It will be a cohesive force which will strive to give perspective to the overall third year biochemistry program through student participation and guest speakers. One hour per week for 36 weeks. Limited to Dr. Byrne and Staff

203. Chemistry of Natural Products. Course is required in the Ph.D program in Biochemistry and is available to all who wish a more sophisticated understanding of the molecular structure, physical and chemical properties of sugars, polysaccharides, fatty acids, simple and complex lipids, steroids, etc. Two hours per week for 18 weeks. First and second

quarters. Limited to 40 students. Dr. Davidson

301. Energy Metabolism. Required course in the Ph.D. program is often selected as part of a minor in Biochemistry. It is a lecture course on the intermediary metabolism of carbohydrates and lipids. Included are detailed consideration of biological oxidations, oxidative phosphorylation, and the control of energy-yielding pathways. Three hours per week for 18 weeks. First and second quarters. Limited to 40 students. Drs. Wakil, Wheat, Fridovich, and Lynn

302. Nitrogen Metabolism. A required course in the Ph.D. program, this course is often selected as part of a minor in Biochemistry. It is devoted to consideration of the biosynthesis of nitrogen-containing compounds, including amino acids, purines, pyrimidines, and proteins. The fate of preformed or synthesized nitrogen-containing compounds is also discussed. Amino acid biosynthesis is used as an opportunity to discuss the control of biosynthetic pathways through enzyme inhibition and regulation of protein biosynthesis. Two hours per week for 18 weeks. Third and fourth quarters. Limited to 40 students. Drs. Kamin, Greene, and Kirshner

304. Proteins and Enzymes. This is a required course in the Ph.D. program. After consideration of the chemical characterization and synthesis of amino acids, peptides, and proteins, the theoretical basis and interpretation of physical techniques such as ultracentrifugation, spectrophotometry, titration, viscometry, light scattering, x-ray diffraction, and optical rotatory dispersion as applied to proteins are discussed in detail. After a treatment of enzyme kinetics, enzymes are considered in terms of the mechanism of their action and useful chemical models of enzyme activity. The terminal series of lectures is used to illustrate current research efforts which are aimed at a molecular understanding of the known physiological properties of selected enzymes and structural proteins. Four hours per week for 18 weeks. Third and fourth quarters. Limited to 40 students. Drs. Tanford, Hill, and Byrne

310. Genetics. This is a required course in the genetics Ph.D. program but is available to other students. It will be taught by faculty from the genetics division of the Biochemistry Department and will include a comprehensive survey of classical genetics, mammalian genetics, microbial and virus genetics, cytogenetics, population genetics, functions of DNA, functions of RNA, and genetic mechanisms. Three hours per week for thirty-six weeks. Limited to forty students. Drs. Guild and Gross

312. Clinical Chemistry Laboratory. The students may participate in the program of the Clinical Chemistry Laboratory. Students must receive the permission of the instructor. Minimum of twenty clock hours per week for three to nine weeks. Limited to eight students. Dr. Thiers

345-346. Graduate Seminar. This is a required part of the Ph.D. program. Each Ph.D. candidate must register for two semesters, and he is expected to attend regularly during his entire time in the Ph.D. program. During the first semester students give a seminar on one of a series of related topics under the direction of one faculty member. During the second semester students select their own topics and an appropriate faculty adviser. One hour per week for 36 weeks. Limited to 25 students. Staff

Clinical Cancer Training Program

Professor W. Shingleton, Chairman; Professor N. Kaufman; Associate Professors J. Laszlo, G. Wilbanks, J. Cavanaugh, S. Porter, S. Heyden

The Clinical Cancer Training Program, supported by a grant-in-aid from the USPHS, is designed to improve clinical cancer training for the

medical student and for the postdoctoral trainee.

The basic course, Survey of Cancer, Basic and Clinical (209), is an interdepartmental survey of basic and clinical cancer. It is offered the second and fourth quarters as an elective to junior and senior medical students and for postdoctoral fellows in the Training Program. course time is forty hours a week. It is limited to eight students.

Additional time is spent in those areas in the Medical Center primarily involved with cancer diagnosis and treatment, such as Surgical Pathology, Radiotherapy, Medical and Pediatric Hematology, and inpatient and outpatient tumor services of the Departments of Surgery and Obstetrics and Gynecology. The student or trainee may choose one or several of these areas in which to work, and individual programs can be developed for each participant according to his specific interests.

The Training Program is supplemented by a tumor registry where accurate follow-up records are available to staff and students. The data collected include results of treatment of large numbers of patients as expressed in percentages of those (1) free of recurrence, (2) apparently cured, (3) having a recurrence, or (4) dead of recurrence at varying times after onset of the disease and the institution of therapy.

The faculty for the Training Program consists of selected members of the Medical School faculty who possess an interest in clinical cancer teaching and who are designated for this type of teaching by their

department heads.

Community Health Sciences

Professor E. Estes, Jr., Chairman; Professors W. DeMaria, E. Long, D.

Smith; Associate Professors S. Heyden, E. Persons, T. Williams; Assistant Professors R. Portwood, M. Bryson, W. O'Fallon; Associates D. Naumann, C. Knight

Required Course

The required course in *Community Health Sciences* (200) will be given during the second year. Two hour lectures are given by faculty and guests each week. This series serves as an introduction to biostatistics, epidemiology, industrial medicine, community health and family physician, and transmission and natural history of some diseases.

Elective Courses

201. Family Health: Human Response to Environmental Agents. The range and variation of human response to overt and subtle environmental agents will be studied prospectively. The normal adaptative and immunologic mechanisms through which the human acts and reacts to maintain health will be discussed in chronological sequence from conception through senility. Fundamental and applied information from medical, clinical, and social sciences will be included. Conditions or diseases with (1) known etiologic agents, such as viral, bacterial, fungal, or parasitic, and (2) unknown etiology, such as hypertension and peptic ulcer, will be discussed. Third quarter. Four hours a week. Dr. DeMaria and Staff

203. International Health Organizations. A survey of the history, organization, and accomplishments of the World Health Organization and its regional offices, health programs of the U. S. Agency for International Development, the Alliance for Progress, the Rockefeller, Kellogg, and other private foundations. Smaller private organizations (HOPE, MEDICO) and their contributions will be considered. Prerequisite for International Medicine. Second quarter. Three hours a week.

Limited to five to ten students. Dr. Long and Staff

205. International Medicine. Course will include a survey of the interrelationship of health with political, economic, and educational programs, with emphasis on the problems of developing countries. Health problems of Latin America and Middle Africa will be given detailed consideration. The course will include a written paper by each participating student. Course on International Health Organizations is a prerequisite. Third quarter. Three hours a week. Limited to five students. Dr. Long

207. Research Preceptorship in International Health. Student makes a detailed study of a major health problem in the Western Hemisphere, using library and other resources. Spanish language instruction will be included through the Summer School program. The preceptorship will include a visit to a Latin American country for which financial assistance

will be available. Courses on International Medicine are prerequisites. All quarters. Thirty-two hours a week. Limited to five students. Long and Associates Abroad

209. Research Preceptorship in Studies of Renal Function and Vasculature. Students can enter into current projects or conduct independent study under senior staff guidance. The studies range from enzyme analysis of specific tissues under autonomic and pharmacologic influence to human conditioning experiments involving the cardio-renovascular systems. Full time for at least three consecutive quarters. One or two students by

special arrangement. Dr. DeMaria

210. Student Community Health Program. Student studies at first hand the health problems of communities in the United States and abroad. During the first summer, the student undertakes a research fellowship in Public Health Sciences at the School of Public Health at the University of North Carolina and instruction in Spanish (if necessary). During the second summer the student undertakes field work under supervision in public health in Guatemala. During the third quarter the student works at a mission hospital in Nicaragua with reduced supervision. Financial assistance is available. All quarters. Thirty-two hours a week. Limited to two students a year. Drs. Long and DeMaria; Faculty of Department of Community Health Sciences and of School of Public Health, University of North Carolina; Faculty of Department of Preventive Medicine, University of San Carlos, Guatemala; and Dr. Edwin Wallace, Director of Gray Memorial Hospital. Nicaragua

211. Adolescent Medicine. Series will review primarily the sequence of biological events occurring during this transitional phase of human development. Relationship of these factors to the diseases and psychosocial problems encountered will also be discussed. Second quarter. Four hours a week. Drs. DeMaria, Persons, Portwood, Naumann, and

Guests

213. Student Health. On half time (afternoon) for one or two quarters

by special arrangement. Dr. Persons and Staff

215. Biostatistics. Course intended to provide a basic understanding of the principles of statistical interference as applied to the problems in medicine and biology. Program will include basic probability and statistical theory with special emphasis on estimation and hypothesis testing. Third quarter. Three hours a week. Dr. O'Fallon

Endocrinology

Associate Professor H. Lebovitz, Director; Associate Professor H. Mc-Pherson, Director, Endocrine Clinic; Professors R. Bressler, J. Kostyo; Associate Professors C. Christian, C. Peete, R. Stempfel, J. Wynn; Assistant Professor R. Gibbs; Associate E. Horton

Fellows L. Baker, J. Ellis, J. Goldman, J. Herring, T. Huff, C. Johnson, H. McDaniel, A. Nadler, B. Sheikholislam

The Division of Endocrinology was organized by Dr. E. C. Hamblen in 1936 as a division of the Department of Obstetrics and Gynecology. In 1955 it was reorganized as an integrated service with a staff drawn from several clinical and preclinical departments. Its objective is to give comprehensive training in basic and clinical Endocrinology and metabolism, particularly at the postgraduate level. Although individual senior staff members have their own special clinical and research programs, the division is organized so that clinics, conferences, ward rounds, and seminars are participated in as joint ventures by the entire staff. The endocrine laboratory and its services are available to all members of the staff equally. Resident physicians from Medicine, Obstetrics and Gynecology, and Pediatrics rotate through the endocrine division. At any one time there are usually four residents assigned to the division. Clinical and research fellows and trainees are assigned to individual senior staff members, depending on their major interest, but all participate essentially equally in the clinics, teaching rounds, and conferences.

The general Endocrine Clinic meets two mornings and the Metabolism-Diabetes Clinic one morning each week. The Pediatric Endocrine Clinic meets one afternoon a week. All fellows have the opportunity to attend these clinics and in addition the clinical fellows assist in the care of the private patients with endocrine and metabolic disturbances including diabetes. Twice a month the endocrine clinic meets jointly with the neurosurgical tumor follow-up clinic to review patients with pituitary tumors and related brain lesions. Ward rounds on inpatients are held from 4-5 p.m. Monday and Friday and at 9 a.m. on Wednesday each week. An endocrine conference is conducted weekly. In addition, each of the supporting services (Medicine, Obstetrics and Gynecology, and Pediatrics) has special conferences, lectures, and seminars of endocrine

interest which are available to the staff.

Elective Courses

205. Mechanisms of Hormone Actions. This seminar series is designed to explore the biochemical mechanisms involved in the actions of representative types of hormones. First quarter. Three hours a week. Drs. Lebovitz, Bressler, Gibbs, Christian, Stempfel, McPherson, and Staff

207. Metabolic Response to Disease. This seminar series deals with the integrative aspects of the endocrine-metabolic response to disease states. Representative topics include the events involved in adaption to feeding, fasting, injury, surgery, infection, and certain medical disorders

(i.e. diabetes, hypoglycemia, etc.). Fourth quarter. Three hours a week. Drs. Lebovitz, Bressler, Gibbs, Christian, Stempfel, McPherson, and Staff

Medical Research Training Program

Professor W. Guild, Director; Professors S. Gross, M. Moses; Associate Professor K. McCarty; Assistant Professors O. Jones, Z. Lucas, T. Mc-Manus

The Medical Research Training Program (399) is an elective program available to qualified students after completion of the first two years of the curriculum, and to members of the Duke Hospital resident staff, postdoctoral fellows in the clinical and preclinical departments, and qualified graduate students.

The objective of the program is to provide a more sound basis for the future work of those hoping to devote their lives to a career in investigative medicine and biology. Approximately eight medical students and eight postdoctoral fellows are accepted annually. Applicants are admitted upon recommendation by a faculty committee on the basis of past academic performance, evidence of research bent and curiosity, and

motivation toward an academic research career.

The program offers an academic year (September to June) of full-time research training in medical sciences basic to clinical investigation, and emphasizes primarily cell and molecular biology. It includes three types of activities. (1) Three months are devoted to an extensive series of laboratory experiences in cytology and fine structure, cell and tissue culture, biochemical studies of cell growth, microbial and biophysical genetics, protein synthesis and its genetic determination, physical biochemistry of nucleic acids and of proteins including antibodies and enzymes, membrane functions, and organized cellular controls. These three introductory months are designed to familiarize the student with concepts and experimental approaches in these fields, and with the use of important and complex tools and techniques not ordinarily taught in undergraduate courses. (2) Six months are devoted to a research problem conducted either in the general laboratory set apart for this program or in the laboratory of one of the faculty with whom the participant chooses to work. (3) Seven hours per week, throughout the year, are devoted to class work in mathematics, biostatistics, and physics in courses expressly designed for students of this program. During the research period, one evening each week is devoted to seminar work. Special lectures are given by guests from the University faculty or from other institutions. The entire program is housed in a special wing of the W. B. Bell Medical Research Building, and is under the direction of members of the faculty who devote themselves largely to this training program.

The qualified medical student can participate in this program without delaying his graduation and without increasing the cost of his education. By using two summers of clinical studies, and by receiving elective credit for two of the four quarters in the training program, he enters his senior year abreast of his class. After the new curriculum begins, this course will fulfil requirements for the third or fourth basic science year. He receives a training stipend of \$300.00 per month during those quarters of the program for which he does not receive curriculum credits toward graduation. He ultimately pays the same tuition as any other medical student.

The Graduate School of Duke University will also accept the total of the first two years of medical school plus participation in this program as residence time toward the degree of Doctor of Philosophy. In addition, the individual student must satisfy the language and dissertation requirements of the Graduate School and any special requirements stipulated by the department in which he elects to obtain this degree. The combined degree program is arranged individually and requires a minimum of five and a half to six years.

It is suggested that medical students undertake this program at the completion of the first two years of the curriculum and then return to the normal clinical medical curriculum. Such students should also expect to undertake two or more years of a postdoctoral research fellowship in the course of their residency training in order to prepare themselves fully for research oriented careers in academic medicine.

Medicine

Professor E. Stead, Chairman; Professors M. Bogdonoff, R. Bressler, J. Callaway, E. Estes, O. Hansen-Pruss, J. Hendrix, A. Heyman, W. Kempner, G. Kerby, W. Lynn, H. McIntosh, E. Menefee, M. Musser, W. Nicholson, E. Orgain, E. Persons, J. Ruffin, R. Rundles, H. Sieker, J. G. Smith, M. Tyor; Associate Professors S. Friedberg, J. Greenfield, K. Kilburn, J. Laszlo, H. Lebovitz, H. McPherson, T. Peele, E. Peschel, J. Pfeiffer, R. Robinson, H. Saltzman, D. T. Smith, R. Whalen, J. Wynn; Assistant Professors T. Andreoli, C. Armstrong, I. Brody, C. Buckley, J. Clapp, W. Dobbins, J. Flanagan, W. Floyd, C. Gerber, R. Gibbs, R. Gorten, J. Gunnells, C. Hayes, O. W. Jones, R. Klein, J. Kylstra, R. McCloskey, S. Osterhout, R. Portwood, W. Rosse, F. Schoonmaker, H. Silberman, H. Thompson, A. Wallace D. Young; Assistant Clinical Professors A. Cooper, C. Styron; Associates J. Boineau, M. Dick, J. Hijmans, B. Newborg, W. Troyer; Clinical Associates S. Barefoot, W. Batten, J. Bumgarner, G. Crane, W. Fitzgerald, P. Gebel, H. Grode, T. Jones, G. Koury, T. Long, E. Lupton, J. Lusk, D. Miller, J. A. Moore, H. Perkins, J. Robbins, W. Singletary, A. D. Smith, D. Welton

Instructors T. Asmundsson, J. Baez-Garcia, V. Behar, B. Bernstein, F. Dalton, J. Douglas, M. Dunaway, R. Durrett, G. Ellis, A. Ferguson, J. Gaither, E. Gear, R. Gilgor, J. Goldman, C. Grim, J. Gutterman, L. Gutterman, J. Hall, A. Harley, J. Harper, L. Harris, P. Hathaway, K. Heaton, D. Holloway, R. Hornsby, T. Huff, N. Hunt, C. Johnson, J. Kioschos, Y. King, C. Mansbach, H. McDaniel, W. McMillan, W. Miller, A. Nadler, J. Nowlin, D. Romhilt, J. Ruskin, S. Schaal, R. Schneider, T. Sugimoto, J. Temple, J. Tipton, J. Tomasini, A. Walston, H. Westfall, H. Zeft, D. Zipes *Chief Residents* H. Carpenter, R. Dowell, V. Rhoades, B. Tharp; Assistant Residents G. Basson, M. Basson, D. Bigner, G. Blumenchein, G. Butcher, F. Cobb, H. Cohen, S. Elias, L. Entman, S. Fortney, M. Freund, J. Garbutt, P. Imperato, R. Karpick, R. Katz, K. Krauss, E. Lewis, G. Miller, A. Newsome, L. Nilsen, J. Nordlund, T. Pozefsky, A. Price, K. Quickel, C. Riley, J. Roberts, S. Rostand, E. Rutsky, J. Rygorsky, R. Schwartzman, R. Shultz, R. Snyderman, G. Wagner, K. Wright; Interns R. Appen, E. Borden, G. Cunningham, W. Davis, H. Delcher, V. Dennis, B. Festoff, P. Gertman, J. Gordon, T. Guiney, E. Hammett, C. Herron, C. Hopkins, G. Kline, S. Kohler, G. Logue, L. Lohrbauer, J. Males, D. Miller, J. Nash, C. Norton, J. Nuckolls, W. Obenour, M. Rotman, M. Rozear, G. Scott, J. Sewell, D. Smith, P. Springberg, K. Straub

Required Courses

The Department of Medicine traditionally has the responsibility of preparing the student for a lifetime of learning as he gives care to patients who ask him for help. The first step is to begin to think and act like a doctor. Two courses in the first year-Introduction to Clinical Medicine and Clinical Microscopy-prepare the student to take an active role in

patient care.

The student assigned to Medicine, or electing Medicine, in the second and fourth years acts in the role of a physician. His desire to give good care is the motive which drives him to excellence. He learns to identify properly the problems of the patient. Having identified the problems, he marshals the information which he can bring to bear on them by his past training; he recognizes the gaps in his knowledge as he attempts to focus the information learned from the basic sciences onto the specific clinical problem. Using the patient as his means of integration, he continues his reading in anatomy, physiology, microbiology, pharmacology, and biochemistry. In this clinical setting, he has the opportunity to speak many words which he has previously only read; he discusses the problem with his fellow students, interns, residents, and senior staff; he gains familiarity with ideas and concepts by actively manipulating them.

The student crystallizes his idea of the best diagnostic and therapeutic approach to this particular patient. He identifies the reasons for each of these decisions. He has real curiosity to see if his evaluation of the situation is correct or in error. He learns that the course of biology is uninfluenced by strong statements, by the rank of the faculty member, or by the number of supporting references not quite applicable to the points

in question.

Under guidance from his fellow students and from faculty of all ranks, he slowly appreciates the difficulties of learning in this system of multiple variables operating on only partially defined substrates. Part of a doctor's learning is only experimental. He knows from living with his patients that certain things are possible, but he does not know the underlying sequence of events. In other instances, his learning is more precise because he understands and can control some of the important variables. He must learn both the liabilities and virtues of attempting to use logic in clinical practice.

The goal of the Department of Medicine is for the student to have as many learning experiences as possible in which he plays an active role. We hope that he will enjoy these learning experiences so much that he will continue them as long as he sees patients. We are not interested in covering the entire field of medicine. If one of our graduates meets a new problem, correctly identifies it, and has pleasure in solving it, we are satisfied. We are not concerned that a new area of knowledge is being

explored without our guidance.

In caring for our patients with ill-defined genetic and acquired differences and with many variables of unknown strength at play, many erroneous conclusions are drawn. The student has to learn to examine statements, both oral and written, with care, and to ask of all authorities the source of data which underlie their conclusions. One way for the student to learn the difficulties in drawing accurate conclusions about biological systems is to give him the opportunity to establish some fact on the basis of his own work. We call this research, and find it a very effective method of teaching. The intellectual discipline involved better prepares him for the role of a lifetime learner.

The health field is a broad one. Anyone with intelligence enough to gain entrance to the Medical School can find an area where he can be happy and productive. We are interested in producing manpower for the entire field. We are not interested in molding our students into any single career in the health field. The faculty accepts the fact that our intake is heterogeneous and that our output will be heterogeneous. Our role is to identify the area where the individual will be most productive and happy, and to help him reach this goal. We will continue to produce general practitioners, specialists, administrators, research workers, biologists, government workers, and various combinations. There is no special honor attached to any of these roles. Our primary interest is that our graduates are productive and receive emotional and intellectual satisfaction from their work.

201. Introduction to Clinical Medicine. Course is initiated in the first

year by introductory lectures, case discussions, and instruction in methods by physical examination and history taking. Early in the course, students begin work at the bedside in the examination of selected patients. The emphasis throughout is placed on instruction individually and in small groups. The interpretation and pathologic physiology of abnormal findings are stressed. Instruction in the more specialized methods of examination in provided by coordinating the lectures, case discussions, and individual student instruction from the departments of Medicine, Neurology, Obstetrics and Gynecology, Pediatrics, Psychiatry, Radiology, and Surgery. In addition, the lectures and laboratory sessions in Clinical Microscopy are coordinated with the overall program. In the latter part of the year, special emphasis is placed on student correlation of the history, physical finding, and pathologic physiology in the individual patient problem.

203. Clinical Microscopy. Course is given in the first year and, along with lectures and assignments providing practice in history taking and physical diagnosis, comprises an introduction to medicine designed to equip the student to participate in patient care on the wards and in the clinics. The essentials of hematology are reveiwed. Laboratory work includes blood cell counts, the preparation and interpretation of blood films, and the examination of fresh material, such as urine, stools, spinal fluids, sputum, transudates, and exudates. This course is supplemented in the clinical years by hematology conferences and by daily ward and

laboratory rounds.

205. Second Year Medicine. The student spends one term of his second year in Medicine where he is assigned to one of the medical wards or to the medical clinic. He forms part of a medical team composed of interns. first year residents, and senior staff and takes an active part in the care of patients. The number of patients assigned to him does not vary with the load. He is given this protection to allow him time for synthesis of his basic science experiences with the problems of his patients. When indicated, the undergraduate experiences are integrated with the graduate program. In such an instance, the program of each student is worked out individually.

Elective Courses

207. Advanced General Medicine. Course provides advanced training and experience in general medicine. The student is assigned to the inpatient and outpatient services to work up and follow general medical problems in close association with the house staff and consultants. This course will teach techniques of diagnosis and application of therapeutic programs. The student is responsible for the patient and will learn about disease and its management through the staff directly concerned with the patient, and through the consultant services which will assist in the

diagnosis and care. Full time for nine weeks. Offered throughout the year. No limitation on student number. Dr. Stead and Department of

Medicine Staff

209. Allergy and Chest Diseases. Course provides both an introduction and depth in the clinical and laboratory aspects of allergic and respiratory diseases. The student works up and follows the patients assigned to this service in both the outpatient department and in the hospital or in consultation. There is instruction in allergy and clinical immunology with seminars and conferences in more basic immunology in cooperation with the Department of Microbiology and Immunology. The student learns the techniques and interpretations of pulmonary function studies and may attend seminars and conferences in pulmonary physiology in cooperation with the Department of Physiology. Provisions are made for library or clinical research problems. Full time for nine weeks. Offered throughout the year. Limited to six students. Drs. Sieker, Menefee, Kilburn, Saltzman, Buckley and Staff

211. Behavioral Medicine. Course provides training in understanding and applying the principles of human behavior in managing patient problems in general medicine. The student works with and follows patients in the medical outpatient and inpatient divisions, being supervised by the senior staff and associate staff of the division. Emphasis is placed upon interpreting the natural history of illness and the patient's response to the illness, and upon utilizing the features of the individual's behavior as keys to the management of the clinical problem. There is a seminar and patient conference review of the basic science information relative to this area and a series of comprehensive seminars conducted with the Departments of Sociology and Psychology. Participation in clinical and laboratory research problems is part of the program. Full time for nine weeks. To be offered throughout the year. Limited to five students.

Bogdonoff, Klein, and Staff

213. Cardiovascular Diseases. Course is primarily patient oriented, but allows the integration of problems in clinical evaluation and clinical care with those of more advanced laboratory investigation. The curriculum allows the student to develop a continuing relationship with one senior person in the cardiovascular division throughout the entire nine-week period. Since the division does offer a variety of learning experiences, the student may participate also in the forms of investigation and care which are the particular interests of the individual section of the cardiovascular division. The student is assigned a certain number of patients for evaluation and follows these patients through their specialized study, participating in the phonocardiographic and electrocardiographic studies as well as cardiac catheterization if this is indicated. There are a number of conferences and seminars, including a student working conference in which the student presents and discusses the pertinent data derived on the patients he is following. There is a student seminar in which selected

topics are reviewed to provide more completeness and depth in a given area. The student also participates in the scheduled conferences and clinics. Opportunity is provided for participation in related seminars in pathology and physiology. Full time for nine weeks. To be offered throughout the year. Limited to six students. *Drs. Orgain, McIntosh*,

Floyd, Whalen, Estes, Wallace, and Staff

215. Dermatology. Course is an introduction to dermatology, with emphasis on diagnosis and management of skin disorders based on the pathophysiologic and biochemical alterations in these diseases. Students are assigned to patients in the hospital and are responsible for their supervised evaluation and care. In addition, the student receives extensive experience in the private and public outpatient departments where he performs diagnostic and treatment procedures under the direction of the staff. Scheduled seminars and conferences provide opportunity for group instruction. Although it is not the major emphasis of the course, interested students may participate in library, clinical, or laboratory investigation. Full time for nine weeks. Offered throughout the year. Limited to four

to eight students. Drs. Callaway, Smith, Tindall, and Staff

217. Gastroenterology. Course is designed to emphasize the role of the gastrointestinal tract and liver in general medical disorders, and to serve as an introduction to illnesses which primarily involve the liver and gastrointestinal tract. Experience is obtained from patients directly assigned to members of the senior staff as well as those seen through the private and staff consultation service in the outpatient gastroenterology clinic. In addition, the student rounds on all patients with the resident, fellow, and senior staff. He also participates or assists in the various techniques available in the laboratory for the diagnosis and evaluation of gastroenterological disorders. There are clinical conferences in cooperation with the Departments of Radiology and Pathology, weekly seminars concerned with the physiological and biochemical problems related to hepatic and gastrointestinal function, and the opportunity for library or clinical research in a specific problem. Full time for nine weeks. Offered throughout the year. Limited to four students. Drs. Ruffin, Tyor, Dobbins, Young, Webster, and McLeod

219. Hematology (Cancer). Course is intended to provide advanced training in diagnosis and management of hematologic disorders, including cancer in general. The student works up and follows patients in the inpatient and outpatient services. He participates in the special diagnostic studies and in the laboratory evaluation used in following these patients. There are seminars and conferences and the opportunity for library and clinical investigation in a particular problem area. Full time for nine weeks. Offered throughout the year. Limited to five students. Drs.

Rundles, Laszlo, and Staff

221. Metabolism and Endocrinology. The student learns the clinical and laboratory diagnosis of metabolic and endocrinologic disorders.

He is responsible for the work-up and follows patients on both the inpatient and outpatient services. He participates in the special studies and gains experience in managing metabolic disorders under the supervision of the staff. In particular, experience is provided in the endocrinology laboratory and in radioisotope techniques. Full time for nine weeks. Offered throughout the year. Limited to four students. *Drs. Lebovitz.*

McPherson, Nicholson, and Staff 225. Renal Diseases. Course offers detailed instruction in the clinical and laboratory aspects of hypertension and nephrology. It provides the basic foundation for a physiological approach to the diagnosis and management of patients with renal disorders, abnormalities of fluid and electrolyte metabolism, and hypertension. The student assumes full responsibility for the complete initial evaluation and subsequent followup of both inpatients and outpatients. Through the laboratory facilities, the student becomes familiar with the clinical application of specialized methods for the evaluation of renal function. Active participation in specialty rounds, conferences, and seminars is required. Students are systematically introduced to the mechanics and therapeutic applications of hemodialysis and peritoneal dialysis, the diagnostic evaluation of the hypertensive patient, the physiological approach to disorders of fluid and electrolyte metabolism, elements of renal pathology (in cooperation with the Department of Pathology), and medical aspects of urologic surgery (in cooperation with the Division of Urologic Surgery). Although the primary emphasis is on education, the opportunity exists for limited participation in various research projects in clinical dialysis, immunologic aspects of renal disease or transplantation (in cooperation with the Division of Immunology), pathophysiology of renal disease, and the hormonal causes of hypertension. Full time for nine weeks. Offered throughout the year. Limited to four students. Drs. Robinson, Gunnells, Kempner, Peschel, and Staff

227. Rheumatology. Course is designed to provide experience in the understanding and care of patients with connective tissue diseases. Basic mechanisms are explored in light of current knowledge, and the student participates in all inpatient and outpatient activities. By working with patients assigned to him under staff supervision, he learns the clinical and laboratory techniques available to him for their diagnosis and care. Full time for nine weeks. Offered throughout the year. Limited to four stu-

dents. Drs. Persons, Jones, Kerby, and Staff

Microbiology and Immunology

Professor N. Conant, Chairman; Professors D. Amos, J. Beard, E. Day, J. Larsh, D. T. Smith, H. Willett; Associate Professors S. Osterhout, R.

Metzgar, R. Wheat, C. Zmijewski; Assistant Professors R. Burns, J. Flanagan; Associate C. Buckley

Research Associates M. Dudley, G. Hill, H. Seigler, C. Tritschler: Research Assistant I. Cohen; Technical Associate H. Craig; Instructors H. Nielson, A. Proctor; Fellows R. Buckley, N. Erbakan, B. Hattler

Required Course

The required course in Microbiology (200) is given in the second term of the first year. An intensive study is made of the common bacteria, fungi, and viruses which cause disease in man. The scope of the laboratory course is reasonably wide and acquaints the student with all the methods and procedures employed in bacteriological laboratories. Most of the lecture time is devoted to the immunological and epidemiological aspects of infection. The instruction is designed to give the students a clear concept of: (1) how organisms gain entrance to the body, (2) the type of toxins which they produce, (3) the nature of the immune bodies which are produced by the host, and (4) the methods of preventing the disease by active and passive immunization.

Elective Courses

310. Microbial Physiology. A lecture and seminar course on the physiology and comparative biochemistry of micro-organisms. Third and

fourth quarters. Three hours a week. Dr. Burns

325. Medical Mycology. Course offers an intense study of those fungi which cause disease in man and animals, and it will emphasize the diagnosis and treatment of fungus infections as well as give special attention to the epidemiology and public health significance of the fungi studied. First quarter. Nine hours a week. Drs. Conant and Nielsen

329. General Microbiology. This is a lecture/seminar course devoted to the occurrence, relationships, and comparative biochemistry of microorganisms. Prerequisites: Biochemistry and Microbiology. First and

second quarters. Ten hours a week. Dr. Wheat

330. Clinical Microbiology and Infectious Diseases. This lecture course covers the etiology, pathogenesis, clinical manifestations, diagnosis, treatment, and prevention of infections due to bacteria, fungi, and viruses. First quarter. Three hours a week. Limited to five students.

Drs. Osterhout, Flannagan, and McCloskey

331. Infectious Diseases. This is a course in the fundamentals of diagnostic microbiology and clinical applications. Work will consist of performing diagnostic procedures, assisting in consultations, case presentations, and limited investigative work if desirable. All quarters. Thirtytwo hours a week. Limited to two students. Drs. Osterhout, Flannagan, and staff

231. Fundamentals of Immunology. A course on general immunology including the following: nonspecific factors in immunity, nature of antigens and antibodies, antibody production, complement, serological methods, blood groups, autoimmune diseases, tumor, immunity, transplantation immunity, and hypersensitivity. First and second quarters. Eight hours a week. Drs. Amos, Day, Metzgar, and Zmijewski

314. Immunochemistry. Studied are: structure of antibody molecules; nature of the combining site; hapten as a molecular probe; forces involved in antigen-antibody interaction; specificity, avidity, and crossreaction of antibodies; purification of antibodies; and antibodies as analytical reagents. Prerequisite: Fundamentals of Immunology or Biochemistry or Physical Chemistry or consent of instructor. First and second quarters. Eight hours a week. Dr. Day

313. Immunohematology. Lecture and laboratory demonstrations blood groups, iso-antigens, and antibodies. First and second quarters.

Two hours a week. Dr. Zmijewski

320. Immunogenetics. Study of inbred and coisogenic strains, mutation and recombination in inbred animals and tumors. Genetic control of histocompatibility iso-antigens in tumors and normal tissues, and differential gene action in hybrids and tumors. Antigenic and immunological factors in homograft rejection, tests for genetic compatibility. Modification of the immune response by genetic or immunological procedures: tolerance, enhancement, and suppression of antigens. Third and fourth quarters. Two hours a week. Dr. Amos

312. Tissue Immunology. A critical analysis of progress in a major branch of immunological research covering cancer antigens, the tumor-homograft reaction, and the immunotherapy of cancer. Prerequisite: consent of the instructor. Third and fourth quarters. Eight hours a week.

Dr. Day

333. Radioimmunochemistry. Laboratory course to acquaint student with problems and techniques of labeling antibodies with radioisotopes and with localizing radioactive antibodies in tissues. First and third quarters. Thirty-two hours a week. Limited to two students. Dr. Day

334 Immunochemistry of Cell Surface Components. A seminar/experimental research course designed to give the student a working knowledge of the composition, structure, metabolism, and immunological nature of the cell surface components of bacterial, fungal, and mammalian cells. Prerequisites: Biochemistry and Microbiology. Third and fourth quarters. Thirty-two hours a week. Limited to two students. Dr. Wheat

335. Immunology of Human Tissue. Course intended to provide the student with an opportunity to study in the laboratory the serological aspects of any disease he may be interested in which may possess a tissue or organ-specific antigen. First and second quarters. Thirty-two hours a week. Limited to two students. Dr. Metzgar

Operating Committee: Professors E. Busse, J. Harris, A. Heyman, G. Odom, T. Peele, J. Robertson, E. Stead, D. Tosteson, F. Vogel, W. Wilson; Associate Professors W. Byrne, R. Carson, J. Goree

(Neurology) Associate Professor J. Pfeiffer; Assistant Professors C. Armstrong, I. Brody, C. Gerber, S. Heyden, M. Kinsbourne, S. Schanberg; Associate R. McMasters; (Neurosurgery) Assistant Professors S. Mahaley, B. Nashold, G. Tindall; (Psychosomatic Medicine) Professor M. Bogdonoff; Associate R. Klein; (Cerebral Circulation) Professors W. Young, H. McIntosh; Assistant Professors H. Saltzman, H. Thompson, R. Whalen; Associate R. Gorten; (Neurophysiology) Assistant Professor G. Somjen; (Pediatrics) Associate Professor J. Sidbury; Associate A. Renuart; (Psychology) Professor I. Diamond; Assistant Professor L. Thompson; (Neuroendocrinology) Associate Professor C. Christian; (Neuropathology) Associate G. Klintworth; (Neuro-Ophthalmology) Assistant Professor B. Anderson, Jr.; Associate J. Gills; (Physical Therapy) Assistant Professor E. Flanagan

Fellow Y. Kong; Chief Resident B. Tharp; Assistant Residents M. Basson, D. Bigner, W. Elias, A. Gabor, G. Slaughter

The Neurologic Sciences Program was established in April, 1964, to integrate and enlarge the neurologic teaching and research facilities in the Medical Center. It is an interdisciplinary unit comprised of several preclinical and clinical departments whose interests are specifically related to the various neurologic sciences. Its purpose is to provide greater learning experience for the undergraduate student and more comprehensive opportunities for training and research at the graduate level. The Program is designed to train physicians and scientists who will have an understanding of the concepts and mechanisms of neurobiology and their particular application to the diseases of man.

The Program is directed by an operating committee composed chiefly of the chairmen of the various departments of the Medical School related to the neurologic sciences. The staff members include personnel from ancillary divisions in the Medical Center such as Psychosomatic Medicine, Neurophysiology, Psychology, and Neurosurgery. Although each staff member has his individual teaching and research interests, all participate actively in joint conferences, ward rounds, and seminars given primarily for the undergraduate and graduate student interested in the neurologic sciences. These teaching activities are designed to provide the student with an understanding of the problems of clinical neurology as well as to introduce him to research experience which will serve as a foundation for future study of the nervous system. Selected areas of neurochemistry,

neurophysiology, neuropathology, and neuroanatomy are available for

investigative studies.

The Program provides opportunities for neurologic training of resident physicians from the Departments of Medicine, Neurosurgery, and Psychiatry. Conversely, fellows and house officers in Neurology are assigned to various staff members for training in Neuropathology, Neuroanatomy, Electroencephalography, Pediatric Neurology, and Neurosurgery. Joint faculty appointments may be held in Neurology and in the other clinical or basic science departments to provide an integrated approach to the teaching and research training of the undergraduate and graduate physician.

Teaching ward rounds for students, fellows, and resident physicians are conducted by senior staff members of the Neurologic Science Program five mornings a week at Duke University Hospital and the affiliated Veterans Administration Hospital. Outpatient clinics are held twice weekly for follow-up care of patients discharged from the hospital and for treatment of new patients referred from other clinics or outside physicians. An extensive series of teaching conferences and seminars comprise an

integral part of undergraduate and postgraduate training.

Elective Courses

202. Introduction to Neuroscience. This laboratory and seminar course acquaints junior students with laboratory methods and experimental design used in basic neuroscience research. It is designed as a prerequisite for subsequent electives in neuroscience research and will provide fundamental information as to techniques currently used in investigative work in neurohistopathology, neuropharmacology, neurophysiology, and psychophysiology. First quarter. Thirty-two hours a week. Limited to eight students. Drs. Hein, Gerber, Schanberg, Armstrong, Somjen, and Robertson

204. Correlative Neuroscience. This course includes two clinical seminars each held two hours a week on physiologic and metabolic mechaisms in patients with neurologic disease. It is recommended particularly as an adjunct to clinical clerkships in Neurology, Neurosurgery or Internal Medicine. All quarters. Four hours a week. Limited to fifteen

students. Dr. Brody and Neurology Staff

206. Clinical and Laboratory Clerkship in Neurology. This clerkship is offered for students interested in pursuing research or clinical careers in Pediatrics, Medicine, Neurology, Psychiatry or Neurosurgery. Emnisms in patients with neurologic disease. It is recommended particularly diseases and interpretation of laboratory techniques. All quarters. Thirty-two hours a week. Limited to four students. Drs. Heyman, McMasters, and Neurology Staff

Obstetrics and Gynecology

Professor R. Parker, *Chairman*; Professors F. Carter, W. Cuyler, W. Thomas; Associate Professors W. Cherny, C. Christian, C. Peete; Associate Clinical Professors E. Easley, R. Pearse; Assistant Professors M. Crenshaw, A. Christakos, G. Wilbanks; Assistant Clinical Professors T. Adkins, W. Graham, K. Podger; Associate C. Von Roebel; Clinical Associates T. Stokes, R. Williamson

Research Associates C. Jones, L. Kaufmann; Clinical Lecturers L. Palumbo, R. Ross; Clinical Instructors F. Bowles, E. Rodwell; Instructors C. Hammond, D. Moore, P. Pearce, R. Seaton; Fellows B. Baker, S. Herring, R. Yowell, B. Younger; Residents N. Copeland, F. Nicks; Assistant Residents A. Bahrani, J. Danford, W. Goldston, D. Halbert, K. Johnson, E. Long, Z. Newton, C. Parker, L. Walker, T. Wyatt

Required Courses

The first year student receives instruction in the fundamentals of obstetric and gynecologic history and pelvic examination during their course in Introduction to Clinical Medicine.

The second year student spends seven weeks in General Obstetrics and Gynecology (202). The student attends lectures, works daily in the general and special outpatient clinics, and is assigned patients on the obstetric and gynecologic wards. Students sharing in patient care and in teaching exercises is required. Tutorials are held daily with the senior faculty encouraging student participation. Lectures, Clinical Conference, Gynecologic Pathology Conference, Endocrine Conference, and Correlative Seminars are a part of his learning experience and are outlined below.

201. Lectures. Didactic and clinically pertinent information is offered only in order to gain insight into and understanding of the effects of pregnancy, or diseases of the reproductive system, as they relate to his major field of interest. All quarters. Four hours a week. Dr. Parker and Staff

203. Clinical Conference. Problems in diagnosis and management are presented for consideration and discussion. Current patients, from the wards and the outpatient department, are selected. Course in general obstetrics and gynecology is a prerequisite. All quarters. Two hours a Drs. Parker, Carter, and Staff

205. Gynecologic Cancer. A survey of malignancy of the reproductive system. The didactic portion of the course is supplemented by presentations of patients currently in therapy on the wards and in the Gynecologic Cancer Clinic. All quarters. Three hours a week. Drs. Parker and Wilhanks

207. Pathology: Obstetrical and Gynecological. The emphasis is upon

the gross and microscopic study of the removed tissues of the reproductive system, correlation of the findings with the clinical observations, and consideration of the implications as to the future well-being of the patient. General Pathology is a prerequisite. All quarters. One hour a

week. Dr. Wilbanks and Staff

209. Correlative Seminars. Exploration in depth of certain specific subjects both within the discipline and from some of the parameters. Discussions and presentations include disorders of other tissues and organ systems, and the influence upon the effects from pregnancy or gynecologic malfunction. All quarters. One hour a week. Staff and invited faculty

211. Preparation for Practice. For students preparing for: General Practice, Pediatrics, General Surgery, and Internal Medicine. Inpatient and outpatient duties as an intern in Obstetrics and Gynecology. Special lectures in obstetric management and office gynecology with emphasis on good practice techniques. All quarters. Thirty-two hours a week.

Limited to five students. Dr. Parker and Staff

213. Research Training. For students who desire fundamental training in research methodology in Obstetrics and Gynecology. Rotation will be provided through various laboratories. The student, by active participation in investigative projects, learns research techniques and methods as they apply particularly in Endocrinology, Cytogenetics, Cytology, Bacteriology, Chemotherapy, Maternal and Fetal Physiology, Toxemia, and others. All quarters. Thirty-two hours a week. Limited to fourteen students. Dr. Parker and Staff

215. The Infertile Couple. Didactic and clinical study of human infertility. Assigned reading of pertinent medical literature, both historical and current, is correlated with clinical observation in patients. The student is made familiar with testing techniques and the use of the required apparatus and instruments, and participates in the treatment of patients. All quarters except summer. Six hours a week. Limited to

two students. Drs. Peete and Christakos

217. Human Embryology. Students will study human growth and development in utero. In addition to assigned reading and lectures, pertinent gross and microscopic material shall be studied. Incorporates Developmental Anatomy, Physiology, Biochemistry and, as available, Developmental Pathology. First and third quarters. Four hours a week. Limited to six students. Dr. Cherny

221. Genital Cytology. A survey of clinical genital cytology. Special instruction is provided in preparation of material and interpretation of cytologic appearances. The general cytology library contains adequate resource material and current patient slides for study. First and third quarters. Six hours a week. Limited to four students. Dr. Cuyler and

Miss Kaufmann



223. Gynecologic Bacteriology. Work in the Laboratory of Gynecologic Bacteriology is carried out to provide a basic knowledge of special techniques in aerobic and especially in anaerobic culture. Correlation is made with clinical findings in patients with gynecologic infections. Participation in basic research is expected. First and second quarters. Eight hours a week. Limited to four students. Dr. Carter and Mr. C. P. Jones

225. Research Preceptorships. By individual arrangement with the faculty. Although research project assignments are the major undertaking, emphasis is maintained on the clinical implications and applications of the research.

227. Clinical Preceptorships. Primary emphasis on clinical applications of patient care. Teaching is done with current patients. Ambulatory treatment, ward rounds, and operating and delivery room experience is provided. By individual arrangement with faculty.

229. Endocrinology Seminar (Depts. Ob-Gyn, Medicine, and Pediatrics): Sessions with discussion of interesting clinical problems and related clinical and basic research. All quarters. One hour a week.

Christian from Ob-Gyn Dept. plus other members of divisions of Endo-

crinology

231. Clinical Endocrinology. Course for students who desire additional clinical instruction in examination, diagnosis and treatment of obstetric and gynecologic patients with endocrinopathy. Course consists of examination and treatment of patients in the Endocrinology Out-Patient Clinic. All quarters. Eight hours a week. Dr. Christian and Staff and Fellows of Endocrine Division

233. Neuroendocrinology. Provides laboratory exposure in the methods of neuroendocrine investigation, including stereotoxic stimuli and lesions, isotope localization, and immunochemistry of the ovulation-inducing hormones, as well as rounds on those endocrine patients pertinent to the topic. Any quarter by special arrangement. Thirty-two hours a week.

Dr. Christian

235. Cytogenetics. For student who desires experience in the genetic basis of disease. Course includes clinical studies as well as basic steps and procedures in cytogenetic research. Second and fifth quarters. Eight hours a week. Limited to four students. Dr. Christakos

237. Developmental Biology. Course represents a joint endeavor by the Departments of Obstetrics and Pediatrics with the help of members from the Departments of Anatomy, Biochemistry, Pathology, and Physiology. The student will explore problems of fertility and sterility, ovulation and implantation, placental transfer, fetal physiology and biochemical differentiation, and perinatal events and postnatal development. Examples for discussion will be drawn from the clinical material on the wards of Duke Hospital. First and third quarters. Sixteen hours a week. Limited to three to five students. Drs. Crenshaw and Harris

239. Perinatal Physiology. An obstetric-pediatric study of factors concerning the mother and infant during pregnancy, labor, delivery, and the first month of life. Emphasis will be placed on teratogenic influences, abnormal conditions of pregnancy as related to the infant, prenatal pathological conditions adversely afflicting the fetus and newborn in the prenatal area, and hospital and early house management of the infant, especially as related to parent-child adjustments. When possible, a family will be followed during the pregnancy and throughout the first month of the infant's life. Second and fourth quarters. Thirty-two hours a week. Limited to three students. Drs. Crenshaw and Bromley

Ophthalmology

Professor J. Wadsworth, *Chairman*; Professor Emeritus B. Anderson, Sr.; Clinical Professor Emeritus F. Stocker; Assistant Professor B. Anderson, Jr., A. Chandler, J. Gills; Clinical Associate S. McPherson, Jr.

Research Associate G. Klintworth; Instructors E. Reese, G. Cousar, W. Hull; Clinical Instructor L. Turner; Clinical Assistant T. Kerns; Residents G. Cousar, W. Hull; Assistant Residents D. Driver, J. Foster, F. Hannah, J. Karickhoff, W. Lefler, J. Price, J. Trant, N. Young

Elective Courses

There are a number of elective courses available to those medical

students who are especially interested in ophthalmology.

201. Investigative Ophthalmology. The student is assigned a project relating to basic science of ophthalmological problems. The student is provided with technical assistance, and the sufficient equipment and animals necessary for the completion of his problem are made available. Laboratory space will be available in both the fields of clinical research and basic investigation. The student will be expected to attend the lectures scheduled for the house staff. All quarters. Thirty-two hours a week. Limited to one student. Drs. Gills and W. Banks Anderson, Jr.

203. General Ophthalmology. The student will participate in the regular house staff activities which include the instruction in the use of specialized apparatus generally used in the diagnosis and treatment of the regular house staff activities which include the instruction in the use of specialized apparatus generally used in the diagnosis and treatment of ophthalmic disease. The student will examine and treat patients in the outpatient clinic and may observe at frequent intervals in the operating room. He will be expected to attend the ophthalmology teaching rounds and clinics. All quarters. Thirty-two hours a week. Limited to two students. Dr. Chandler

205. Medical Ophthalmology. The ophthalmic signs and symptoms of systemic diseases are presented by illustrated lectures. Such a course should be of interest to students in any field of clinical medicine. This course requires skill only with the direct ophthalmoscope. Emphasis is on the diagnosis of systemic diseases by the recognition of their ocular manifestations. All quarters. Four hours a week. Limited to twenty students.

207. Basic Ophthalmic Sciences. Postgraduate course designed primarily for those students intending to specialize in ophthalmology. This course covers optics, ocular anatomy, ocular physiology, ocular pathology, ocular pharmacology, and numerous ophthalmic diseases. Individual lectures are given by members of the senior staff of Duke University Medical Center as well as those from the North Carolina Memorial Hospital in Chapel Hill. Outstanding speakers from other medical centers will also lecture at frequent intervals. This course is given each Tuesday night from 7:30 to 9:30 during the academic year. Dr. Wadsworth 209. Refraction. Purpose of this course is to train students in basic

knowledge of refraction and the prescription for glasses. All quarters. Thirty-two hours a week. Limited to one student. *Dr. Chandler*

211. Neuro-Ophthalmology. Experience provided in application of ophthalmic diagnostic techniques toward the diagnosis of central nervous system diseases. The use of special instruments helpful in establishing a diagnosis will be emphasized. Such a course is carried out in cooperation with the Divisions of Neurology and Neurosurgery. All quarters. Sixteen hours a week. Limited to one student. Dr. Gills

213. Ophthalmic Pathology. Once weekly, the student reviews the ophthalmic pathology specimens submitted during the week and assists in collecting the case histories for presentation at the weekly ophthalmic pathology conference. Prerequisite: either General Ophthalmology or Basic Ophthalmic Science. All quarters. Four hours a week. Limited to

one student. Drs. Wadsworth and Klintworth

215. Ocular Diseases in Children. A clinic for the study of ocular diseases in children will include such conditions as muscular imbalance and congenital diseases, as well as neoplastic diseases of children. All quarters. Three hours a week. Limited to one student. Dr. Chandler

Pathology

Professor T. Kinney, *Chairman*; Professors D. Hackel, N. Kaufman, J. Vazquez, F. Vogel; Professor Emeritus W. Forbus; Associate Professors B. Fetter, A. Musser, P. Pratt, D. Rowlands, Jr., J. Sommer, B. Trump, B. Wittels; Assistant Professors P. Burkholder, W. Bradford, J. Elchlepp, H. Sage, G. Spooner, W. Johnston, G. Klintworth, M. Vazquez; Associate C. Mauney

Research Associate W. Jurgelsky; Instructor B. Brawley, III; Technical Associates C. Bishop, J. Pickett; Fellows J. Balentine, B. Dick, A. Dudley, F. Ginn, D. Graham, R. Quiroga, N. Ratliff, L. Taylor; Residents C. Barringer, M. Leakan; Assistant Residents E. Bossen, S. Butcher, H. Gerber, F. Graybeal, R. Guerry, W. Latham, J. McCarter, M. Quinn, J. Rozwadowski, R. Mathews, B. Schlein, J. Werner; Interns J. Bradford, C. Daniels, T. Edmonds, S. Gardanier, II

Required Course

The required course in *Pathology* (200) is given during the second term of the first year. The fundamentals of Pathology are presented to the studnt by a correlated study of gross and microscopic material illustrating the structural changes in disease. Lectures developing broad concepts of disease processes are given by the members of the senior

staff. Conferences with small groups of students under the guidance of a staff member are scheduled for purposes of more intimate discussion. The emphasis is placed on etiology and pathogenesis of disease and the experimental approach to an understanding of disease. Animal experiments performed either by students or by demonstrators are used to correlate functional and structural changes in disease. The group work is supplemented by weekly conferences involving the class as a whole and dealing with problems presented by current autopsies and with other problems of general importance. Student collaboration in postmortem studies is required. Cases thus studied are presented by the student before the class under the direction of the staff; this takes the form of a clinical-pathologic conference in which each student plays a particular role.

Elective Courses

201. The Pathologic Basis for Clinical Medicine. Study of disease is approached by an examination of the pathologic processes as these affect the various systems and organs. An attempt will be made to orient the student in special pathology and to help him crystallize and apply the basic knowledge that he has acquired in the prerequisite Pathology course. The course will be organized with lectures, laboratories, and experimental demonstrations. Clinical pathologic correlations, including correlation with radiologic findings, will be stressed. The case method of teaching will be emphasized and material from current and past autopsies utilized. The systems to be covered are the cardiovascular system, endocrine, respiratory, gastrointestinal, genitourinary, female genital, hematopoietic, bones and joints, neuromuscular organs of special sense, and skin. Prerequisite: Pathology. First quarter. Twenty hours a week. Dr. Kaufman and Staff

352. Biochemical Pathology. This is an advanced course in diseases of the cardiovascular system with particular emphasis on the heart. A seminar-tutorial system will be used to explore physiological expressions of morphological abnormalities of the heart. Specific problems in heart disease and experimental approaches toward solution of the problems will be discussed and dealt with. First and second quarters. Four hours a week. Limited to ten students. Dr. Wittels

353. Advanced Neuropathology. Students will be supervised in a detailed study of gross and microscopic neuro- and ophthalmologic pathology and in a review of neuroanatomy. They will assume limited responsibility for the performance of postmortem examinations upon patients with neurologic diseases. Opportunities will be provided for an introduction into research methods, notably electron microscopy, as utilized in investigations of the nervous system. Third and fourth

quarters. Three hours a week. Limited to twenty students. Drs.

Vogel, Klintworth, and Staff

203. Ophthalmic Pathology. Course is designed for students with an interest in ophthalmic diseases and will consist of lectures, seminars, and laboratory sessions. The normal anatomy, embryology, and physiology of the eye will be reviewed, and the various reactions of the eye to injury will be studied in gross and microscopic specimens. The more common diseases will be considered in detail. Second quarter. Three hours a Dr. Klintworth

205. Introduction to Immunopathology. Course is designed primarily for students planning to pursue postgraduate training in Pathology. The student is considered a full-time research fellow and will perform selected experiments in which he will utilize techniques of immunochemistry, immunohistochemistry, and morphology. In addition, the student will have the following scheduled appointments, twice a week: (a) formal lecture; (b) group discussion with staff; and (c) gross and microscopic morphology of selected human cases with immunopathologic conditions. The student will be given adequate time for library research and preparation assigned topics for verbal and written presentations. First and second quarters. Four hours a week. Limited to five students. Dr. Vazquez and Staff

207. Exfoliative Cytology. Course will include study of available cells from various sources for diagnostic purposes. The identification of cell type, structure, and function will be done by applying various physical and chemical methods. Concomitant histological studies will be carried out. Particular emphasis will be given to diagnosis of malignant neoplasms. Experimental work and reviews of literature will be utilized as part of the study in this course. First quarter. Six hours a week. Limited Dr. Johnston to six students.

209. Obstetrical and Gynecological Pathology. Course is designed for the student who is oriented toward obstetrics and gynecology. Classroom work in the first seven weeks will include a coverage of all diseases involving the pregnant and non-pregnant female genital tract. The last two weeks of the course will be devoted to the practical application of the acquired knowledge through the study of current materials. Two days of study will be devoted to exfoliative cytology of the female genital tract. The student will be expected to participate actively in all phases of the course. First quarter. Twelve hours a week. Limited to five students. Dr. Fetter

211. Neoplastic Disease. Problems and concepts in neoplasia will be considered. The pathogenesis of certain types of tumor will be studied and consideration will be given to etiologic factors such as genetic, viral, physical, and chemical. The influence of chemotherapeutic agents on neoplasia, both at the cellular and sub-cellular level, will be studied.

Seminars and laboratory periods. First quarter. Six hours a week. Dr.

Kinney and Staff

213. Pulmonary Pathology. Course is designed for students with an interest in pulmonary disease. The various diseases of the lung, neoplastic, infectious, and others, will be evaluated in relation to pathogenesis and etiology. Anatomic alteration will be correlated with functional incapacity and with the clinical findings. Third quarter. Eight hours a week. Limited to six students. Dr. Kinney and Staff

215. Pediatric Pathology. Course is designed to serve the interests and the needs of the students interested in Pediatrics. A wide range of diseases associated primarily with pediatric patients will be studied. An attempt will be made to correlate pathological findings with the clinical picture. Second and fifth quarters. Three hours a week. Dr. Bradford

and Staff

217. Histochemistry and Cytochemistry. A range of histochemical and cytochemical observations in cells will be correlated with basic biochemical intracellular processes and the localization of these processes. The qualitative and quantitative alterations in the cells seen in disease states will be studied. The methods utilized in this course will be taught to students who will be expected to carry out the observations on materials which they have prepared themselves. Third and fourth quarters. Five hours a week. Limited to twelve students. Drs. Trump and Sommer

219. Electron Microscopy in Pathology. Course is presented for those students who wish to broaden their basic knowledge of cellular structure and cellular pathology. Formal instruction will be designed to: (1) explain basic electron microscopic technique—its advantages and its limitations; (2) to interpret the rapidly accumulating body of electron microscopic studies in the literature; and (3) to review the areas where electron microscopy has made significant contributions to our understanding of pathology. The resources of the laboratory will be available to demonstrate the techniques of specimen preparation and the operation of the electron microscope. The students will have the opportunity to prepare and examine clinical or experimental pathologic material already on hand and to apply the information obtained through formal instruction. Seminars will be held to involve the students with their subject in depth. Third and fourth quarters. Five hours a week. Limited to twelve students. Dr. Trump and Staff

221. Pathology of the Gastrointestinal System. Course will explore the diseases of the gastrointestinal system, including diseases of the liver and pancreas, in greater depth and breadth than available in other courses. A wide range of diseases of this system will be reviewed, and pathologic changes will be correlated with clinical findings and physiological and biochemical processes. Collected material available in the Department and current material from the autopsy service will be utilized. Material from surgical pathology will be used as it becomes available and the

findings will be correlated with the clinical symptoms manifested by the patients on the ward. Diseases covered will be congenital, nutritional, neoplastic, infectious, and metabolic. Seminar and group teachings will be combined with laboratory periods. First quarter. Three hours a week.

Limited to five students. Dr. Fetter and Staff

358. Cellular Pathology. Subject and the objectives of this course will be introduced by a historical review followed by detailed demonstration, discussion, and, in the laboratory period, selected application of methods of investigation in cellular pathology. Subsequently, the structural equivalent in individual cells of the injured function of total organs will be discussed. The final portions of the course will be devoted to the specific cellular pathology of viral, neoplastic, and other selected diseases as well as to diagnostic cytology. First and second quarters. Two hours a week. Drs. Trump and Sommer

223. Autopsy Pathology. Students work directly with one of the members of the Pathology staff. They will first assist at autopsies and then perform a few selected autopsies. The emphasis will be on a very careful study of a small number of cases, selected to exemplify important pathologic processes. The examination of cases will include correlated reference to other cases on file in the Department and to appropriate current and old literature. All quarters. Thirty-two hours a week. Limited

to four students. Staff

225. Cardiovascular Pathology. Course will stress clinical correlation with pathologic problems in the cardiovascular system. The normal anatomy and embryology of the cardiovascular systems will be reviewed, including a consideration of the normal and abnormal conducting system and electrocardiogram. The various disease processes will be studied in detail, utilizing gross and microscopic specimens, examination of patients with similar diseases, and consideration of laboratory diagnostic techniques. Third quarter. Four hours a week. Limited to sixteen students. Dr. Hackel and Staff

227. Abnormal Growth and Development. A survey of experimental studies of genetic, chemical, and physical factors related to disorders of development and growth with review of normal embryonic and fetal development; induction and organizers; cellular differentiation and interaction; and development arrest, mechanism of action, and specificity of teratogenic agents. Two hours per week as seminar group. Each student to meet instructor individually for one hour tutorial per week. Fifth quarter. Limited to eight students. Dr. Elchlepp and Staff

229. Study of Abnormal Growth and Development. Laboratory techniques in experimental embryology and teratology, including demonstrations of dependent differentiation, induction of malformations, production of chromosomal abnormalities, and karyotyping. Limited to five students. Prerequisite: concurrent enrollment in Problems in Abnormal Growth and Development. To meet as one three-hour laboratory period

per week for nine weeks. Fifth quarter. Three hours a week. Limited to five students. *Dr. Elchlepp*

357. Research in Pathology. Independent research projects in the various fields of pathology. All quarters. Thirty-two hours a week.

Dr. Kinney and Staff

231. Laboratory Medicine. Course will give the student understanding of the theoretical and practical bases of various laboratory procedures. Methodology and sources of error will be considered, and correlations made between laboratory findings and physiologic and biochemical alterations in disease processes and in various disease states. The shortcomings and the benefits derived from the rational and critical utilization of laboratory procedures will be emphasized. This course will act as a bridge between the basic science and clinical science disciplines. The student will learn to evaluate present tests and procedures and their modifications and will learn to evaluate critically new procedures as they evolve and develop. The knowledge obtained previously in biochemistry, pathology, hematology, and microbiology will be drawn upon heavily in this course. The teaching techniques utilized will be seminars, tutorials, laboratory periods, and visits to the wards. All quarters. Eight hours a week. Limited to four students. Dr. Musser and Staff

233. Pathology of Bones, Joints, and Related Structures. Various diseases of the bones and joints will be reviewed and studied. The course will be structured around seminars and laboratory periods when gross and microscopic material will be studied. Emphasis will be placed on the natural history of the lesion, pathogenesis, and correlation with roent-genographic, clinical, and laboratory findings. Fourth quarter. Three

hours a week. Staff

235. Pathology of Urinary and Male Genital System. Main purpose of course will be the detailed study of diseases of the urinary and male genital systems, correlating basic science, pathologic, and clinical aspects. The normal anatomy, embryology, and physiology of the kidney will be reviewed, and various congenital, inflammatory, neoplastic, toxic, and hypersensitivity renal diseases will be studied. Gross and microscopic specimens will be available and will be correlated with practical patient problems. A similar approach will be followed for the male genital system. A few selected animal demonstrations of pathologic processes will be performed, permitting some experience with immunopathologic and electron microscopic problems. Second quarter. Four hours a week. Limited to sixteen students. Dr. Hackel and Staff

237. Surgical Pathology. Course is designed for the student who wishes more experience in the study of disease. Although the course is entitled Surgical Pathology, this does not imply interest solely in the individual oriented to surgery. Examination of all tissues removed will be performed so that problems in Dermatology, Gynecology, Orthopaedics, General Surgery, Internal Medicine, and other specialties will be considered. The

primary emphasis will be upon study of the removed tissues and correlation of these findings with the clinical observations. Each day's work will consist of three parts: (1) study of gross material; (2) study of microscopic sections; and (3) ward rounds. Second quarter. Twenty hours a week. Limited to five students. Drs. Fetter and Smith

Pediatrics

Professor J. Harris, Chairman; Professors J. Arena, S. Dees, A. McBryde, J. Sidbury, Jr., R. Stempfel, Jr.; Professor Emeritus W. Davison; Associate Professors W. DeMaria, M. Kinsbourne, F. Porter, M. Spach, A. Spock; Assistant Professors J. Boineau, G. Brumley, Jr., R. Canent, Jr., J. Fowler, H. Harris, L. Hohman, H. Lowenbach, G. Lyon, Jr., T. Peele, A. Renuart, J. Warshaw; Assistant Clinical Professors S. Cornwall, W. London; Associates N. Enzer, J. Jones, E. Long, S. Osterhout; Clinical Associate D. Shearin, G. Watson, B. Webb; Research Associate B. Sheikholislam

Instructors R. Buckley, H. Heick, G. Powell, W. Rocha, L. Rogers; Clinical Instructors C. Bailey, J. Brewer, M. Claxton, F. Eastwood, W. Farley, A. Johnson, T. Jones, D. Lockhart, W. London, N. Moseley, C. Neal, III, A. Rice, B. Skinner, J. Whatley, Jr., Fellows C. Ayers, S. Blumenschien, M. Jarmakani, G. F. Powell, G. K. Powell, J. Rand, W. Rocha, L. Rogers, B. Sheikholislam; Chief Resident W. Scroggie; Senior Residents A. Carter, V. Jain, B. Keenan, K. Lewis, S. Zirkle; Assistant Residents J. Ashe, T. King, R. Krueger, J. Minus, J. Powell, J. Rouse; Interns A. Alexander, W. Becker, L. Bloom, R. Ford, E. Hammett, R. Jones, S. Kahn, A. Lewis, F. Morris, Jr., L. Obenour, V. Perriello, Jr., K. Ray

Required Course

The basic course in *Pediatrics* (200) consists of seven weeks during the second year, the time being equally divided between clinic and ward services. Students participate in the morning subspecialty clinics, the well baby clinics, and afternoon general medical pediatric clinics, seeing both new and return patients. Conferences are held at the end of the following speciality clinics: hematology, metabolism, neurology, cardiorenal, allergy, convulsive disorders, behavior problems, endocrinology, and well baby care. There are conferences in the genral pediatric clinic with informal presentation and discussion of patients. On the wards, the students assist as clinical clerks and are assigned patients in rotation. They make daily rounds with the staff. Pediatric nursing procedures are demonstrated by the nursing supervisor. The different subspecialty groups—cardiology, hematology, allergy, endocrinology, dermatology, and metab-

olism—make ward rounds weekly. A joint conference with the senior and resident staff is held twice weekly on topics of pediatric interest, clinicopathologic discussions, case presentation, and for guest lecturers. There is a weekly radiology conference at which the interesting cases of the week are presented and discussed with the radiologist. Each student prepares a paper on a pediatric subject of his own choosing which they present to the entire group in an informal discussion.

Elective Courses

201. General Pediatrics. Student is assigned to the wards, clinics, and newborn nursery according to his interest and goals. In general, he will have an apprenticeship in Pediatrics with learning experiences stemming directly from the patient and his problems. All quarters. Thirty-two hours a week. Limited to eight students. Dr. Harris and Staff

203. Pediatrics Neurology and Convulsive Disorders. Student will examine patients with neurological and convulsive disorders in the wards and clinics of Duke Hospital and in the inpatient facilities of the Murdoch Center. In Dr. Renuart's laboratory at the Murdoch Center, he will learn the techniques and significance of various screening tests for metabolic disturbance causes of mental retardation and convulsive disorders. First and third quarters. Thirty-two hours a week. Limited to two students. Dr. Renuart and Staff

205. Mental Retardation. Survey of medical, psychological, social, and educational aspects of mental retardation, including clinic evaluation and management approaches. Utilization of existing neurologic, endocrinologic, and child guidance clinic facilities, and field work at the Murdoch Center. Second and fourth quarters. Thirty-two hours a week.

Limited to three students. Dr. Renuart and Staff

207. Pediatric Cardiovascular Disease. Most of the elective is spent in clinical areas with close patient contact. An integrated approach will allow the student to work-up the patient on admission, participate in special diagnostic studies (e.g. cardiac catheterization), follow the patient to the operating room, and then participate in postoperative care. Students attend cardiology conferences, ward rounds, and special teaching sessions on electrocardiography, vectorcardiography, phonocardiography and cardiac catheterization. One-third of the elective time may be spent in special areas, such as electrocardiography, experimental surgery, or research. An active interchange of ideas will provide a strong catalyst for the student to view cardiovascular disease as it occurs in children, to obtain a concept of methodology and diagnosis, and to envision an approach to medical and surgical therapy. First, fourth, and fifth quarters. Thirty-two hours a week. Limited to three students. Drs. Spach, Canent, and Boineau

endocrine material through active participation in the operation of the Pediatric Endocrine Clinic and certain non-pediatric endocrine clinics within the Endocrine Division. Students will become acquainted with the techniques of metabolic studies performed on the Clinical Research Unit when patients with hormonal disturbances are available for investigation. Particular stress will be placed upon the application of methods of hormone assay and steroid measurement to the diagnosis of endocrine disorders in childhood. A series of biweekly endocrine seminars (one clinical and one basic) will be conducted for students, assigned house staff, and fellows. In addition, participants will attend the regular conferences, seminars, and ward rounds of the Endocrine Division. All quarters. Thirty-two hours a week. Limited to four students. *Dr. Stempfel and Staff*

211. Allergy and Pulmonary Diseases. Course in the clinical evaluation, diagnosis, and treatment for all types of allergic problems in children such as eczema; asthma; allergic rhinitis; urticaria; food, drug, and bacterial allergies; collagen; autoimmune diseases; and immunological abnormalities. The clinical work is amplified by laboratory experiences, skin testing procedures, pollen identification, preparations of allergens, allergy vaccine, and appropriate immunologic tests. Students will see numerous patients with chronic lung disease, especially cystic fibrosis of the pancreas, and will utilize pulmonary function tests and blood gas analyses as they apply to the respective patients. The students will have an opportunity to see how other medical specialties such as Dermatology, ENT, Psychiatry, Endocrinology, Physiology, Physical Therapy, and Inhalation Therapy relate to the various allergic problems. All quarters. Thirty-two hours a week. Limited to two students. Dr. Susan Dees and Dr. Spock

213. Developmental Biology. Course will represent a joint endeavor by the Departments of Obstetrics and Pediatrics with the help of members from the Departments of Anatomy, Biochemistry, Pathology, and Physiology. The student will explore the problems of fertility and sterility, ovulation and implantation, placental transfer, fetal physiology and biochemical differentiation, perinatal events, and early postnatal development. Examples for discussion will be drawn from the clinical material on the wards of Duke Hospital. Second and fourth quarters. Thirty-two hours a week. Limited to three students. Drs. Harris and Christian

215. Metabolic Disorders. Course open to students, preferably those who have or wish to start a laboratory project. The project may be in any laboratory but must have a bearing on normal or abnormal metabolism. There will be assigned reading, weekly seminars, weekly rounds in conjunction with interdepartmental groups interested in metabolic disorders, and duties in relation to inpatients and outpatients with

metabolic disorders. All quarters. Thirty-two hours a week. Limited to two students. Dr. Sidbury

217. Pediatric Hematology. Course includes all aspects of clinical and laboratory pediatric hematology with emphasis on fundamental concepts as related to hematologic disorders. There will be daily ward rounds, a weekly clinic, weekly slide conferences, and weekly seminars, as well as assigned reading. Students will be encouraged to engage in some individual clinical or laboratory project during the period of the course. All quarters. Thirty-two hours a week. Limited to two students. Dr. Porter

219. Clinical Problems in Maternal-Fetal Interaction. A study of factors concerning the mother and infant during pregnancy, labor, delivery, and the first month of life. Emphasis will be placed on teratogenic influences, abnormal conditions of pregnancy as related to the infant, prenatal pathological conditions adversely afflicting the fetus and newborn, and early management of the infant, especially as related to parent-child adjustments. When possible, a family will be followed during the pregnancy and through the first month of the infant's life. First and third quarters. Thirty-two hours a week. Limited to five students. Drs. Christakos and McBryde

221. Poison Control Center. Student participates in all functions of the Center. He will be on-call for the treatment of these cases in the Emergency Room or ward and will help compile the monthly data, discussing each report with the Director. Seminars will be arranged with the Director and appropriate members of the University faculty (Pharmacology, Pathology, and Biochemistry). All quarters. Sixteen hours a week. Limited to two students. Dr. Arena

223. Preceptorship in General Pediatrics. Student spends several days each week with selected practicing pediatricians or a group of associated pediatricians in Durham. He will participate in daily newbornpremature rounds at Duke and Watts Hospital, conduct well-baby conferences in the town of Durham and at Duke, and attend prenatal conferences and clinics with emphasis on observations of abnormal pregnancy. The aim of this course is to give the student insight into the management of well and ill children in an atmosphere which will prevail when he enters practice. First and fourth quarters. Thirty-two hours a week. Limited to three students. Drs. Arena, McBryde, and Staff

225. Newborn and Premature Infants. Students will have experience in the newborn and premature nurseries. Included will be discussions of prenatal hazards, resuscitation, care of the normal newborn and premature infant, and pathological and normal psychological conditions occurring in the newborn and their treatment. Emphasis is placed on the initiation of parent-child relationships and of breast feeding. First and fourth quarters. Thirty-two hours a week. Limited to nine students. Dr. McBryde

227. Behavioral Aspects of Pediatric Illness. Experience with children will include the impact on the family as well as the psychic and somatic adjustment of the child. Second, third, and fourth quarters. Thirty-two hours a week. Limited to six students. Drs. Jones, Sted-

man, and Staff

229. Research Preceptorship in Child Development. Experience in research and methods of investigation pertaining to behavioral and biological factors in infants and children. May include parent-child relationships, learning, motivation, personality, perception, cognition, psychophysiologic processes, and statistical techniques in common use. All quarters. Sixteen hours a week. Limited to ten students. Dr. H. J. Harris and Staff

Physiology and Pharmacology

Professor D. Tosteson, Chairman

Laboratories of the Division of Physiology:

Professor P. Horowicz, Head of the Division of Physiology: (Cardiopulmonary Physiology) Associate Professor J. Salzano, Chief; Professor Emeritus F. Hall; Associate Professor E. Long; (Cellular Endocrinology) Professor J. Kostyo, Chief; Assistant Professor R. Fellows, Jr.; (Cellular Neurophysiology) Professor J. Moore, Chief; Assistant Professor T. Narahashi; Associate N. Anderson; (Cellular Transport Processes) Professor D. Tosteson, Chief; Assistant Professor T. McManus; Associates T. Andreoli, C. Lee; Research Associate M. Tieffenberg; Visiting Professor D. Dick; (Cerebral Physiology) Associate Professor E. Jobsis, Chief; (Integrative Neuro-Physiology) Associate Professor G. Somjen, Chief; Associates C. Gerber, B. Renkin; (Molecular Physiology) Professor P. Horowicz, Chief; Associate R. Eisenberg; Research Associates P. Gage, M. Pfaffman; Division of Clinical Physiology: Associate T. Andreoli, Head of the Division; Assistant Professors C. Armstrong, S. Boyarsky, M. Dick, R. Gorten, J. Kylstra, R. Stempfel; Associate H. Thompson; Instructor J. Hijmans

Laboratories of the Division of Pharmacology:

Professor E. Renkin, Head of the Division of Pharmacology: (Biochemical Pharmacology) Professor F. Bernheim, Chief; Associate Professor A. Ottolenghi; (Cardiac Pharmacology) Associate Professor E. Johnson, Chief; (Circulatory Pharmacology) Professor E. Renkin, Chief; Research Associate H. Viveros; (Comparative Pharmacology) Associate Professor P. Bentley, Chief; (Hematological Pharmacology) Professor Emeritus G. Eadie, Chief

Division of Marine Physiology and Pharmacology:

(Wrightsville Marine Bio-Medical Laboratory) Professor R. Brauer, Chief: Assistant Professor G. Padilla

Required Course

The required course in Physiology (200) consists of lectures, seminars, and laboratory exercises offered by all members of the Physiology staff during the fall term of the first year. The core course in Pharmacology (200) consists of lectures, seminars, and laboratories offered by all members of the Pharmacology staff during the spring term of the first year. These courses emphasize those facts and general principles of Physiology and Pharmacology which all medical students should learn no matter which of the many careers in medicine and the medical sciences they may choose to pursue.

Elective Courses

201. Foundations of Contemporary Physiology. Topics to be covered include: theory of diffusion in metabolizing systems; metabolic control mechanisms; photophysiology; osmotic equilibria and transport processes; properties of neurons; and properties of contractile systems. Prerequisites are core Physiology, Physical Chemistry, and one year of Calculus, or the consent of the instructor. First and second quarters. Four hours a week. All members of the Physiology Staff

203. Clinical Physiology. A seminar in Human Physiology emphasizing the physiological basis of clinical medicine. Physiological principles are illustrated by examples from clinical cases. First and second quarters. Three hours a week. Drs. Boyarsky, Gorten, Stempfel, and

Staff

205. Physiological Instrumentation. Deals with electronic methods of measurement of physiological variables. The necessity of understanding the physiological system in order to avoid possible interaction between it and the measuring system is emphasized. The concepts and use of feedback to make linear instruments and to perform numerous operations are used throughout the course. Specific topics covered include: passive elements and networks, potentiometric and currentometric recorders and amplifiers, data processing, and measurement of biological potentials, currents, pressure, and flow. First and second quarters. Two hours a week. Limited to five students. Dr. Moore and members of the Dept. of Electrical Engineering

373. Cellular Endocrinology. Concepts of the mechanism of action of hormones are covered with special reference to the effects of hormones on cell membrane permeability and on the activity of enzyme systems. The relationships of these cellular actions of hormones to the hormonal regulation of growth, metamorphosis, osmoregulation, pigmentation, and reproduction are discussed. Third and fourth quarters. Two hours a

week. Dr. Kostyo

204. Topics in Muscle Physiology. Course will cover the following topics: cellular basis of activity in skeletal, cardiac, and smooth muscle; ionic properties of muscle membranes; submicroscopic structure of muscle and the molecular basis of contraction; the problem of electro-mechanical coupling; the mechanics and thermodynamics of muscular contraction; and design and control problems for the production of movement in various animals. Third and fourth quarters. Two hours a week. Dr. Horowicz

377. Cellular Transport. A sequential study of the following topics: the physical chemistry of transport processes which occur in living cells (e.g. diffusion, flow, and electric current), contemporary knowledge of the molecular mechanism of salt and water transport across cell membranes, with special reference to the conversion of chemical bond energy to transport work in active transport, the integration of transport processes in individual plasma membranes to accomplish regulation of cytoplasmic salt and water composition and cell volume, and the secretion of fluids across epithelial cell layers in organs specialized for this function (e.g. intestines, kidneys). Third and fourth quarters. Two hours a week. Dr. Tosteson

207. Physiology and Pharmacology of the Central Nervous System. A seminar in the integrative functions of the central nervous system from simple reflexes involving the spinal cord to complex activities subserved by various regions of the brain. Third and fourth quarters. Two

hours a week. Drs. Somjen, Renkin, and Staff

378. Reproduction. Lecture/laboratory course dealing with mammalian reproduction. The rat and rabbit will serve as the principal laboratory subjects. The following areas will be covered: embryology of the reproduction system; gonadal structure, gametogenesis and hormone production; structure and function of the diencephalic-pituitary system; structural, chemical, and behavioral actions of sex hormones; mechanisms of fertilization and implantation; placental structure and function; and lactation. Third and fourth quarters. Four hours a week. Drs. Kostyo and Everett

376. Cellular Metabolism and Energetics. Metabolic activity of cells is considered from the point of view of the flow of energy through the cell. Special attention will be given to the mechanisms coupling the energy providing systems to the energy utilizing systems. Third and fourth quarters. Two hours a week. Dr. Jobsis

374. Cellular Neurophysiology. Current concepts as to the structure and electrical impulse propagation in nerves. The powerful new experimental techniques used in the study of isolated membranes and the resulting theoretical models are covered. Adaptation of these models

assists in the description of receptor and synaptic properties. The effect of cellular geometry on its function is considered. Third and fourth quarters. Two hours a week. *Dr. Moore*

209. Physiology of Cell Growth and Development. Topics covered in this course will include: population kinetics; thermodynamics of growth; the timing of events of the cell cycle; and molecular aspects of mitosis and of the duplication of cell organelles. Third and fourth quarters. Two hours a week. Dr. Blum

211. Foundations of Contemporary Pharmacology. Chemical and physical principles of drug action are discussed. The role of various molecular properties in determining the biological effects of compounds is emphasized. First and second quarters. Four hours a week. Dr.

Renkin and Staff

213. Circulatory Physiology and Pharmacology. A seminar in the mode of distribution of drugs in the body. Special emphasis is given to the roles of blood flow and permeability factors in determining the rate and pattern of distribution. First and second quarters. Two hours a week. Dr. Renkin

215. Cardiac Physiology and Pharmacology. Cellular activity in the heart and how it is modified by drugs is studied, including the excitation, conduction, and contraction of cardiac muscle fibers in the presence and absence of pharmacologically active compounds. First and second quarters. Two hours a week. Dr. Johnson

260. Cellular Aspects of Drug Action. Cell-drug interaction is studied, emphasizing mechanisms of action and structure-activity relationships of chemical agents. Prerequisites: Organic Chemistry, introductory Animal or Plant Physiology. Undergraduates by permission of instructors. First and second quarters. Two hours a week. Drs. Bernheim and Ottolenghi

Psychiatry

Professor E. Busse, Chairman; Professors I. Alexander, K. Back, J. Botwinick, B. Bressler, S. Cohen, B. Dai, J. Fowler, H. Lowenbach, G. Maddox, J. McKinney, W. Obrist, J. Rhoads, W. Wilson; Professor Emeritus L. Hohman; Associate Professors J. Altrocchi, L. Borstelmann, R. Carson, C. Eisdorfer, I. Gehman, R. Green, H. Harris, F. Hine, M. Lakin, C. Llewellyn, Jr., J. Preiss, B. Shmavonian, G. Silver; Assistant Professors W. Anderson, K. Barclay, E. Clifford, H. Crovitz, N. Enzer, B. Feather, L. Graham, P. Hein, M. Huse, J. Jones, C. Keith, I. Kremen, A. Krugman, M. LaBarre, D. Mayfield, S. Needell, E. Pfeiffer, J. Reckless, W. Spradlin, D. Stedman, L. Thompson, R. Tomlinson, A. Verwoerdt, H. Wang, M. Wertz; Associates M. Amaya, H. Coppedge, E. Crovitz, E. Ellinwood, Jr., C. Erwin, D. Gianturco, D. Leventhal, H. Lineberger, D. Murphy, Z. Pauk, B. Pope, A. Powell, D. Rickel, W. Zung

Staff, Highland Hospital, Asheville, North Carolina: Assistant Professors M. Baldwin, C. Neville; Associates T. Braganza, A. Sagberg; Instructor G. Doss; Psychiatric Social Workers R. Bush, T. Fox, E. Harkins, D. Oestreich

Instructors J. Ball, J. Elmore, D. Fowler, P. Irigaray, F. Harrison, R. Kerr, M. Leventhal, M. Linder, J. Mallory, Jr., N. Pfeiffer, M. Reedy, M. Short, II, L. Stein, D. Thompson, P. Walker, L. Williams, S. Workman; Research Associates F. Jeffers, F. Wilkie; Assistant D. Heyman; Consultant W. LaBarre; Fellows N. Anderson, H. Doerr, B. Drass, O. Escalante, G. Fillenbaum, C. Ganung, T. Haizlip, J. Jackson, A. Klein, S. Lunzer, J. Mancusi, J. Martin, C. McRee, R. Morris, L. Musella, J. Repass, M. Short, S. Sibley, I. Talton, J. Taylor; Chief Resident S. Workman; Residents G. Berken, L. Bryskin, P. Glass, N. Haslett, R. Liguori, J. McNiel, I. Nadler, J. Nunnally, B. Ogburn, P. Smith, M. Sottarelli, O. Trick; Assistant Residents E. Allen, J. Bonner, O. Brodie, L. Cancellaro, S. Conna, R. Demas, A. Derdeyn, J. Gallemore, H. Goldman, A. Grant, M. Haas, D. Hawkins, B. Hydrick, J. Lovvorn, R. Martin, C. Patterson, G. Preston, C. Rich, Jr., D. Robinson, S. Rubin, C. Shimm, K. Thompson, C. Wells, A. Whanger, F. Varese; Psychology Interns R. Bunt, K. Dronsejko, W. Hodges, R. Harper, P. Lewis, W. Mottola, W. Shows

Required Courses

Human Behavior and Psychiatry

In addition to required and elective courses in Clinical Psychiatry this Department offers, through its Division of Human Behavior, course work in the biological and behavioral sciences which form the bases of Psy-

chiatry and the psychological aspects of medicine.

During the first year, 60 hours are devoted to human behavior (200). A lecture series introduces the student to the concepts, techniques, and data of the various sciences most relevant to an understanding of human behavior, thus providing a multifaceted approach to that understanding. Lectures from the fields of behavioral Neurobiology, Psychology, Psychiatry, Internal Medicine, and Sociology discuss behavior from the points of view of heredity and constitution; the central and autonomic nervous systems; inner emotional conflicts and interpersonal relationships; learning, cognition, and perception; and relationships between the individual and his family, the social institutions, and his sub-culture and culture. Both functional and developmental points of view are presented and, in connection with the latter, stages in the development of the individual personality are traced. Wherever possible, relationships between the various approaches to human behavior are stressed. Concurrent with the lectures, a series of small group meetings provide, through

the interviewing of patients and group discussion, opportunity for the further assimilation of the lecture material and its application to specific examples of behavior. The small groups also provide opportunities to introduce effective techniques of human interaction and observation of the primary data of human behavior as well as methods of recording and interpreting these observations. In both the didactic and small group laboratory portions of the course, emphasis is placed upon the complementarity of the biological and psychosocial approaches to human behavior and the relevance of such a combined approach for the practice of medicine.

The required second year course in clinical psychiatry (201) is for seven weeks. The student assumes limited responsibility, under supervision, for diagnosis and treatment of patients on the psychiatric wards, in the psychiatric outpatient clinic, and (through the psychosomatic consultation services) on the non-psychiatric wards of the hospitals. Supervision is directed toward two principle areas. The first is the significant application of concepts of diagnosis, psychopathological formulation, and therapy. Concepts in these areas are drawn from both the descriptiveorganic-directive and the psychoanalytic-psychosocial-psychotherapeutic contributions to current psychiatric thought. Secondly, supervision is aimed at further developing interpersonal techniques of sensitive observation and therapeutic use of the self. Emphasis is placed upon concepts and techniques applicable to all patients as well as those specifically designated "psychiatric." Didactic instruction includes seminars on the principle neurotic conditions (symptomatic, characteriological, and psychophysiological), the major psychoses, emotional problems of childhood, the somatic therapies, psychological testing, and introductory electroencephalography. In addition to rounds and case conferences, students are encouraged to observe psychotherapy and participate in supervised psychotherapeutic encounters whenever appropriate situations can be provided.

Elective Courses

Human Behavior

202. Philosophy of Science and Behavioral Sciences. Survey of current theories of knowledge, particularly as they relate to the special complex problems of empirical meaning, objectivity, measurement, and verification in studies of human behavior. Consideration is also given to the mind-body problem. First quarter. Three hours a week. Limited to ten students. Dr. Hine

203. Introduction to Behavioral Research. An introduction to the logic and principles of experimental design and data processing in psychological research. Emphasis will be upon techniques of experimenta-

tion with molar behavioral variables and upon critical analysis of published research in psychiatrically relevant areas. Philosophy of Science and the Behavioral Sciences is a prerequisite. Second and fourth quar-

ters. Six hours a week. Dr. Carson and Staff

205. Introduction to Statistical Analysis and Inference. An introduction to probability theory and the use of descriptive and inferential statistics is scientific research. Topics include measurement distributions, sampling, scaling, the concept of variance, correlation, and analysis of experimental data. The student will be introduced to the use of parametric and non-parametric techniques suitable for use with behavioral and biometric variables. Third and fifth quarters. Six hours a week. Dr.

Carson and Staff

207. Biological Evolvement and Neural Basis of Behavior. Seminar surveys the biological bases of human behavior through discussions of imprinting; early mammalian affective development; classical and instrumental conditioning with particular emphasis on the autonomic nervous system; the psychological literature on RNA research; electrophysiologic correlates of higher mental processes including learning, memory, and perception; the relevant human and animal literature on EEG; and evoked potentials and microelectrode recording. Theoretical formulations based on communication theory will be presented. First and second quarters. Five hours a week. Drs. Shmavonian, Obrist,

Spradlin, and Staff

209. Human Behavior and Cerebral Dysfunction. Course includes a brief historical review of significant figures and trends of thought in the area of brain function covering the associationistic schools of thought, subsequent development of the reactionary field theories, and recent trends toward the revival of localization of function. Pathological conditions of the brain will be reviewed with emphasis upon how such conditions might differentially affect the structure and function of the nervous system. A presentation of the behavioral correlates of brain damage will be included. Focus will be on an examination of evidence for and against the regional localization of psychological abilities. The course includes five hours of assessment activity with brain-damaged patients. First quarter. Two hours a week. Dr. Thompson

225. Group Dynamics and Group Sensitivity Training. Seminars dealing with the data and theory of small group processes, plus a two-week sensitivity training experience whereby individuals learn about effects of interpersonal interactions and group processes through direct experience. Behaviors and feelings are discussed as these contribute to the development of a specific group culture. In encouraging self-awareness, the technique becomes an education device which offers potential for generalizing to other interpersonal situations. Permission of the instructor is required for participation in this course. All quarters except summer.

One hour a week. Dr. Lakin

213. Personality Development of the Child, Adolescent, and Adult. Personality development from pregnancy through old age, combining biological and psychodynamic approaches. Included are didactic presentations, discussions of assigned literature, and direct observations of, and interaction with, normal children and adults of various ages and in several settings. First, second, and third quarters. Six hours a week. Dr. Harris and Staff

215. Comparative Personality Theory. An examination of models of human functioning from Freud to the present. Topics will include examples from psychoanalytic, interpersonal, field theoretical, and behaviorsitic approaches. Third quarter. Three hours a week. Dr. E. Crovitz

217. Principles of Psychological Assessment. A theoretical and technical introduction to the measurement of individual differences by introduction to the measurement of individual differences by means of psychometric and projective approaches. The student is introduced to the theory of test development and application through an examination of such concepts as standardization, reliability, and validity. Exemplary assessment instruments are subjected to detailed analysis. First and third quarters. Three hours a week. Dr. Huse

219. Social and Cultural Aspects of Illness. A seminar on medicalsocial roles in an institutional context, the doctor-patient relationship, and the hospital as a social organization. First and second quarters. Two

hours a week. Drs. Maddox or Preiss

221. Experimental and Clinical Psychopathology and Psychophysiology Seminar. This seminar examines clinically defined categories of psychopathology and experimentally produced analogues of clinical symptoms. Neurophysiologic, biochemical, sociocultural, psychodynamic, conditioned reflex, and developmental clinical and laboratory studies related to psychopathological symptom formation are reviewed and related to case material whenever possible. The emphasis is on developing testable explanatory concepts of clinical psychosomatic and psychopathologic symptoms, and on the integration of experimental research and clinical observations. First and second quarters. Two hours a week. Dr. Cohen

223. Research Preceptorship in Biological Psychiatry. Course is comprised of selected experiments and instruction in experimental and clinical neurophysiology, physiology, and neurochemistry. The course content can be altered to include other subjects such as neuroendocrinology or neuropharmacology. Full-time for two or three quarters; up to one half time may be used for didactic work in related courses. All quarters. Thirty-two hours a week. Dr. Wilson

Thirty-two hours a week. Dr. Wilson

211. Behavioral Medicine. Course includes instruction and supervision in the application of principles of human behavior to problems in clinical medicine, drawing upon the perspectives of sociology, psychology, and ecology. All quarters except summer. Thirty-two hours a week. Minimum of two students. Dr. Klein and Staff

227. Research Preceptorship in Social Psychology. Experience in the design and execution of research involving small human groups in an experimental setting. Second quarter. Four hours a week. Dr. Back

229. Research Preceptorship in Psychopharmacology. Includes a study of psychotropic drug action on patients and normal subjects, utilizing physiological and psychological measures. All quarters except summer.

Twenty hours a week. Dr. Reckless
231. Research Preceptorship in Psychophysiology. Participation in clinical psychosomatic investigations or laboratory studies with humans or animals in physiology of stress, emotions and behavior, neurophysiology of conditional reflexes, and CNS effects of altered environments and pharmacological agents. Students attend two weekly seminars in neurobiological and psychophysiological research. They are supervised in the use of bioelectrical measures of CNS and ANS activity and are instructed in design of psychophysiological research, statistical analysis of data, the use of analogue to digital conversion techniques, and the programming of data for computer analysis. Human Behavior and Psychiatry are prerequisites or must be taken concurrently with this preceptorship. All quarters. Thirty-two hours a week. Drs. Cohen, Shmavonian, Hein, and Graham

233. Processes of Aging. Information on theoretical and experimental work in the field of aging will be presented by the investigators in many disciplines. Biochemistry, Medicine, Surgery, Psychiatry, Neurosurgery, and Neurophysiology will comprise the biological section. Psychology, Psychophysiology, Sociology, and Economics will comprise the behavioral section. The emphasis will be upon a broad base of current knowledge about the aging process. Students from any medical discipline are welcome. This course will be interdisciplinary in nature throughout. First quarter. Four hours a week. Dr. Busse and Staff

Psychiatry

235. History of Psychiatry. Seminar traces origins and development of current psychiatric concepts and the influence and contribution of both psychodynamic and biologic orientations. Second and third quarters. One hour a week. Dr. Spradlin

237. Language, Communication, and Interviewing. A seminar in interviewing, including verbal and non-verbal communication, formation and resolution of patient resistance, and techniques in the control of the interview situation. Patient interviews and tape recordings will be employed. First and third quarters. Three hours a week. Limited to ten students. Drs. Hein, Spradlin, and Green

239. Psychiatry in a Community Context. Includes epidemiology of mental health and illness and organizational aspects of mental health facilities and services in the community. Second and third quarters.

Two hours a week. Drs. Maddox or Preiss

241. Inpatient Psychiatry: Environmental and Somatic Therapy. A clinical course in inpatient Psychiatry covering diagnosis formulation and therapeutic management including management of the ward milieu and utilization of nurses and ward personnel in therapy. The student's responsibilities for patient care and therapy are increased in accord with his abilities. Therapeutic Environments and Patient Care in a prerequisite or must be taken concurrently. All quarters: Thirty-two hours a week. Limited to sixteen students. Drs. Green, Hine, and Staff

243. Principles and Practice of Outpatient Psychiatry. This is a clinical course in outpatient psychotherapy. Students will interview patients in the psychiatric outpatient clinic and present the findings of the intake interview at a daily conference where diagnosis and disposition are planned. Students will also be assigned to patients for psychotherapy under supervision by senior and resident staff. Attention will be devoted to the operation of a psychiatric outpatient clinic, its psychiatric teams, and the interaction of the clinic with community agencies and resources. In special cases arrangements may be made for continued supervised therapy beyond the single quarter. Half time (9:00 a.m.-2.00 p.m.). All quarters. Four hours a week. Dr. Llewellyn and Staff

245. Psychosomatic Medicine. This is a clinical course in Psychosomatic Medicine which stresses the principles of the psychosomatic approach based on an integration of psychophysiology and psychodynamics illustrated through ward rounds and case conferences. The student assumes responsibility for selected, individually supervised patient care. Students may choose to concentrate on one specific area, e.g. Pediatrics, Obstetrics and Gynecology, Internal Medicine, and Surgery. If the two quarters course is elected, a clinical research project in Psychosomatic Medicine may be included. All quarters. Ten hours a week. Cohen and Staff

247. Psychosomatic Seminar. A review of current concepts of bodymind relationships as they pertain to health and disease. Clinical material and a selective literature review are included. Second and fourth

quarters. One and a half hours a week. Dr. Green and Staff

249. Special Topics in the Psychological Aspects of Medicine. A clinical and reading seminar intended to clarify the importance of various psychologically conceived variables in the practice of medicine. Included are psychological test dimensions, such as intelligence and abstracting ability, and dimensions of individual difference, such as perceptual and cognitive variables. Rounds are conducted to increase the student's awareness of behavioral dimensions in the physically ill patient and their relevance to patient care. Research preceptorships in this area are available following the completion of the structured course. Third quarter. Dr. Eisdorfer Three hours a week.

251. Community Psychiatry and Mental Health. Includes a seminar covering principles of the mental health consultation process with specific reference to the physicians serving it as consultants to individuals, groups, or agencies. The student will observe this process in action with a staff psychiatrist. Discussion will include the principles of preventive psychiatry, the structure of community organization, and the role of the psychiatrist and physician in helping the community find ways of meeting its mental health needs. Community resource people will be brought into these seminars when appropriate and field trips to community agencies will be arranged. Psychiatry in a Community Context is a prerequisite. First and third quarters. Four hours a week. *Dr. Llewellyn and Staff*

253. Principles and Practice of Group Psychotherapy. Student is given an introduction to the principles and application of group psychotherapy. He will observe groups in action and will participate in discussions of observed group processes. First, third, and fifth quarters. Four hours a

week. Dr. Llewellyn and Staff

255. Marriage Counseling in Medical Practice. Seminar deals with concepts of marital pathology, sexual behavior in marriage, neurotic interaction in marriage, and the reaction of marriage to stress. Techniques and methods of premarital and marital counseling will be discussed. Language, Communication, and Interviewing is a prerequisite. First and

second quarters. One hour a week. Dr. Llewellyn and Staff

257. Schizophrenia: Research and Clinical Aspects. Literature seminar reviews theories of the etiology of schizophrenia, including theories at the biological, individual psychodynamic, communication, and family dynamic levels, and concepts of management and treatment of the schizophrenic patient and the patient suffering from related conditions. Third and fourth quarters. One and a half hours a week. Drs. Tomlinson and Hine

259. Clinical Electroencephalography. Instruction in technique and clinical aspects of electroencephalography. Included are didactic and practical instruction in theory and interpretation. Research in clinical EEG may be included. It is recommended that this course be taken concurrently with courses in related areas. First and second quarters. Sixteen hours a week. Drs. Wilson, Green, and Staff

261. Practice of Psychological Assessment Techniques. Demonstrations and practice in the administration and interpretation of psychological assessment techniques with emphasis on the potential utility of these techniques to physicians. All quarters. Three hours a week. Drs.

Huse, Krugman, and Staff

263. Mental Retardation: Birth to End of School Age. Surveys medical, psychological, social, and special education aspects of mental retardation, including clinic evaluation and management approaches. Use is made of existing pediatric, neurologic, endocrinologic, and Child Guidance Clinic facilities, and field work at the Murdoch School. All quarters. Six hours a week. Dr. Stedman and Staff

265. Mental Retardation: Young Adulthood to Old Age. Surveys biological, psychological, vocational rehabilitation, and employment aspects of the adult mental retardate. Included are management and planning with families and sociological problems. All quarters. Six hours a week. Dr. Stedman

267. Emotional Problems of Childhood and Adolescence. This clinical course in Child Psychiatry surveys major psychological problems of children and adolescents. The course consists of lectures, conferences, assigned reading, and supervised clinical experience in the Child Guidance Clinic. All quarters. Thirty-two hours a week. Dr. Harris

and Staff

269. Institutional Resources for Children. Surveys institutional resources in our society for the education and care of children with special needs. The course includes lectures, reading, discussion, field visits, and observation or supervised service to children in the Wright School, Umstead Hospital Adolescent Unit, Murdoch Diagnostic Clinic, and Child Psychiatry Unit. All quarters. Six hours a week. Dr. Harris and Staff

271. Alcoholism. Combines didactic material and contact with a variety of professional personnel and facilities involved in the therapeutic management of persons presenting an alcohol-related problem. All

quarters. Two hours a week. Dr. Maddox and Staff

273. Social Structure and the Life Cycle: The Adolescent. Combines didactic material and clinical experience integrating medically relevant social, psychological, and physiological aspects of an important developmental stage. First and third quarters. Four hours a week. and Maddox

275. Social Structure and the Life Cycle: The Aged Person. Combines didactic material and clinical experience integrating medically relevant social, psychological, and physiological aspects of another important developmental phase. Included are discussions of the cerebral physiology of senescence and the relation of impaired cerebral physiology to mental function in old age. Second quarter. Four hours a week. Drs. Busse,

Maddox, Obrist, and Staff

277. Geriatric Psychiatry. Course includes lectures, supervised literature review, and clinical work in a variety of settings-inpatient and outpatient Psychiatry, private and public hospitals, and interviews with subjects in retirement homes and in a project concerned with psychiatric factors in the lives of community residents. The focus will be upon geriatric psychiatric diagnosis and management. This course is intended for senior students interested in Psychiatry as a career. It is advisable but not required that the individual will have taken the course Processes of Aging in the junior year. Research preceptorships in this area are available. All quarters. Eight hours a week. Dr. Busse and Staff

279. Preceptorships in Clinical Psychiatry. By arrangement with members of the clinical staff, it is possible for students to participate, in varying degrees, in the professional life of clinical psychiatrists. All

quarters. Thirty-two hours a week. Clinical Staff

281. Preceptorships in Clinical Psychiatric Research. May be oriented more toward the participation in, or conduct under, supervision of clinical research projects. All quarters. Thirty-two hours a week. Clinical Staff

Radiology

Professor R. Lester, Chairman; Administrator S. Paine; (Radiodiagnosis Division) Professors G. Baylin, R. Reeves; Associate Professors W. Barry, M. Capp, J. Goree; Assistant Professors I. Johnsrude, S. Kim, R. Rice; Associates J. Chen, J. Jimenez, S. Windler; Instructors R. Bradbury, K. Kim; (Radiation Therapy Division) Associate Professor P. Cavanaugh, Director; Associate Professor A. Sanders; Associate I. Hall; (Nuclear Medicine Division) Associate Professor J. Goodrich, Director; Assistant Professor R. Gorten; Associate A. Wyrick; Instructor K. Sharpe; (Radiation Physics Division) Assistant Professor A. McCrea; (Radiation Technology) Assistant Professor J. Cahoon, Director; Instructor J. Miller; (Clinical Staff) Assistant Professors D. Monson, W. Sprunt; Clinical Associates G. Gray, J. Sherrill, G. Schlaseman, T. Thurston, J. Wear

Residents W. Bender, W. Bennett, J. Buchanan, J. Carranza, C. Carter, H. Connell, S. Forbis, M. Grimmett, L. Grundy, T. Hetherington, R. Jordan, R. McConnell, B. Meares, J. Mikell, J. Ralsten, A. Robinson, J. Sexton, R. Thomas, T. Thompson, L. Totten, T. Vaughan; Fellows W. Hood, H. Piedad

During the first two years, Radiology is not taught as a separate course but is correlated in many of the established teaching programs. In the first year, this occurs in anatomy, clinical pathology and physical diagnosis and in the second year in collaboration with the clinical services. Therapeutic Radiology is taught in a similar manner. Particular emphasis is given during tumor clinics and conferences. The Nuclear Medicine Division teaches mainly on the postgraduate level.

201. Lecture-Demonstration in Diagnostic Radiology. Course is designed to present fundamentals of diagnostic radiology to the student in the form of lectures and demonstrations. A variety of clinical material is used with emphasis on interpretation of roentgenographic findings. All quarters except summer. Four hours a week. Minimum of ten

students. Dr. Lester and Staff

203. Clerkship in General Radiology. Course is designed for the student interested in the methodology of general radiology. Students will engage in film interpretation, fluoroscopy, performance of special diagnostic procedures; and the principles of these and other radiologic modalities will be correlated to the care and diagnosis of patient problems. An introduction to radiation therapy and nuclear medicine is included. All quarters except summer. Thirty-two hours a week. Limited to six students. Dr. Lester and Staff

205. Clerkship in Basic Radiobiology. Course gives an introduction to radiobiology and current trends in research. All quarters except summer. Four hours a week. Limited to four to eight students Dr. Sanders and

207. Clerkship in Pediatric Radiology. This is a specialized program of instruction and participation in the wide variety of radiographic examinations in the pediatric age group. Special correlation of these examinations to the problems of specific diagnoses and patient care will be made. All quarters except summer. Twenty hours a week. Limited to two students. Drs. Lester, Capp, and Chen

209. Clerkship in Neuroradiology. This is a specialized program of detailed instruction in neuroradiology. The program includes performance and interpretation of a wide variety of examinations including cerebral arteriography, brachial arteriography, pneumoencephalography, and others. All quarters except summer. Twenty hours a week.

Limited to two students. Drs. Goree, Jimenez, and Staff

211. Clerkship in Cardiovascular Radiology. This is a specialized program of detailed instruction in cardiovascular radiology. The program includes performance and interpretation of examinations, including visceral and peripheral arteriography, angiocardiography, venography, lymphangiography, and others. All quarters except summer. Twenty hours a week. Limited to two students. Dr. Johnsrude and Staff

213. Clerkship in Gastrointestinal Radiology. This is a specialized program with detailed instruction in gastrointestinal diseases. Program emphasizes the performance and interpretation of gastrointestinal radiologic examination and a wide variety of associated examinations including visceral arteriography. All quarters except summer. Twenty hours

a week. Limited to two students. Dr. Rice and Staff

215. Clinical Radiation Therapy. Course provides an opportunity to observe a wide spectrum of clinical behavior in new cancer patients, follow-up clinic, and in cases undergoing treatment. The course is aimed particularly at students leaning toward gynecology and otolaryngology, as well as general surgery. Prerequisites: Pathology and Physical Diagnosis. All quarters. Thirty-two hours a week. Limited to one or Drs. Cavanaugh, Worde, Raben, and McCrea

217. Clerkship in Radiation Therapy. Course is designed for the student interested in the methodology of radiation therapy. Under supervision, the student will treat selected patients with malignant conditions. The use of chemotherapeutic agents and other forms of therapy for patients with malignant conditions will also be considered. All quarters except summer. Thirty-two hours a week. Limited to four students.

Dr. Cavanaugh and Staff

219. Clerkship in Nuclear Medicine. Course is designed for the student interested in the methodology of nuclear medicine. Practical experience in the performance and interpretation of radioisotope examination and treatments will be emphasized, as well as the consideration of basic mechanisms in such studies and treatments. The use of radioisotopes in research will also be considered. All quarters except summer. Thirty-two hours a week. Limited to four students. Dr. Goodrich and Staff

221. Clerkship in Radiobiology. This is an in-service training course designed for students interested in research careers in radiobiology. The student will participate in the research projects of the Division. Research methodology will be taught, and the student will have an opportunity to engage in a project of his own choosing within the area of radiobiology. All quarters except summer. Thirty-two hours a week. Limited to one

or two students. Dr. Sanders and Staff

Surgery

Professor D. Sabiston, Chairman

Division Chiefs: (Urologic Surgery) Professor J. Glenn; (Orthopaedic Surgery) Professor L. Baker; (Otolaryngology) Professor W. Hudson; (Neurosurgery) Professor G. Odom; (Plastic and Maxillofacial Surgery) Professor K. Pickrell; (Thoracic Surgery) Professor W. Sealy: (General Surgery) Professor W. Shingleton; (Anesthesiology) Professor S. Dent; (Dentistry) N. Ross

Professors E. Alyea, W. Anlyan, J. Bearc, S. Boyarsky, I. Brown, J. Dees, W. Eagles, C. Gardner, N. Georgiade, J. Goldner, K. Grimson, W. Peete, R. Postlewait, G. Quinn, J. Semans, B. Woodhall, W. Young: Professor Emeritus D. Hart; Associate Professors D. Amos, R. Bonar, F. Clippinger, M. Dillon, R. Gregg, K. Hall, B. Nashold, D. Silver, W. Smith, D. Stickel; Assistant Professors E. Anderson, F. Bassett, R. Chen, A. Ferrari, P. Kenan, N. Kirshner, Z. Lucas, M. Mahaley, D. McCollum, B. Nechay, G. Tindall; Assistant Clinical Professors E. Buggs, Jr., J. Davis, G. Ferguson, W. Hollister, L. Mason, C. Patterson; Associates D. Beard, B. King, R. Massengill, B. Sapp, R. Snider, V. Vartanian; Clinical Associates M. Bourgeois-Gavardin, R. Coonrad, J. Glasson, J. Douns, E. Lloyd, T. Pope, H. Schiebel, N. Schupper, S. Kapoor, E. Staub

Research Associates R. Absher, R. Bender, R. Georgiade, U. Heine, P. Labay, A. Langlois, T. Moag, P. Rao, L. Sverak, M. Thiele; Clinical Lectures G. King, L. Meyer, G. Miller, O. Miller, W. Roberts, F. Stel-

ling; Instructors M. Campbell, J. Fortune, C. Levinson, F. Mauney; Clinical Instructors D. Boyer, G. Carver, J. Coppridge, H. Deaton, S. Hobart, J. Hughes, W. Inabnet, G. Lazenby, R. Musgrave, L. Roberts Fellows R. Allgood, A. Chiba, P. Cooper, S. Kato, J. Malin, D. Rignault, K. Shirahige, N. Teague; Residents and Instructors J. Arriaga, C. Cox, W. Edwards, R. Flemma, R. Gingrass, J. Lee, D. Pearsey, M. Pomerantz, D. Rose, J. Seabury, M. Small, J. Ware; Assistant Residents J. Adkins, B. Allen, J. Angelillo, W. Atwill, H. Bailey, D. Bigner, B. Brient, J. Burnam. C. Claxton, R. Cline, J. Dodson, J. Dunn, E. Dyas, R. Enzor, D. Ferlic, H. Ferrari, L. Flint, L. Fort, J. Frank, M. Frankel, H. Friedman, R. Fuson, B. Hattler, G. Henderson, J. Holsinger, R. Jones, J. Kapp, J. Kelly, R. Knott, R. Kramer, R. Kusiak, S. Long, W. Lehmann, W. Leitner, C. Lincoln, R. Mathog, R. Mathews, F. Minkow, R. Mladick, G. Moor, D. Mullen, R. Nasca, H. Oldham, M. O'Neil, J. Patrick, J. Porter, V. Punyahotra, K. Ramming, L. Rogers, N. Ruggiero, H. Ruskin, A. Secrest, D. Slaughter, M. Stephens, H. Stone, L. Thompson, F. Thorne, J. Urganiak, R. Vanderbeek, C. Weber, S. Wells, L. West, R. Wilkins, W. Wolfe; Interns J. Alexander, J. Aplington, R. Applebaum, J. Clark, P. Currie, P. Dempsey, R. Fulk, C. Moorman, C. Niemeyer, R. Osteen, C. Puckett, B. Rodgers, T. Tyler, B. Weber, T. Williams, D. Young, L. Zirkle

Required Courses

The required course in *Surgery* (200) is given during the second year for a seven week period. Students will be assigned patients on the surgical wards for diagnosis and management. In this course attention will be directed toward basic principles in *Surgery* including diagnostic methods and pre- and post-operative care. *Dr. Sabiston and the Surgical Staff*

A second required course, Medical Education for National Defense (MEND) (337), is given during the second year for one week. The course is designed to teach basic principles of disaster medicine, and its goal is to prepare the student to properly handle most medical and surgical emergencies. Included in the course are lectures and coordinated laboratory exercises which stress the pathophysiologic derangements that occur during the emergencies and which indicate how to correct and treat the derangements. Drs. Silver and Bassett

Elective Courses

201. Basic Clinical Surgery. Course is designed to teach the basic principles and concepts of Surgery, including surgical physical diagnosis and diagnosis of the acute abdomen, and will include the diseases of the gastrointestinal tract, endocrine organs, proctology, and surgery of the hernia. Primary emphasis will be on diagnosis, and students may assist in

various operative procedures. First, third, and fifth quarters. Thirty-two hours a week. Limited to ten students. Drs. Shingleton and Peete

203. Survey of Pulmonary, Esophageal, and Cardiovascular Surgery. Course is a continuation of the students' clinical clerkship with emphasis on thoracic disease. The student will be assigned patients and will be responsible for the clinical history, physical examination, and the preoperative studies. He will scrub at the time of operation and will assist in his postoperative care. Attendance is required at daily rounds with the staff. Assigned reading in this field will be required of each student. All quarters. Thirty-two hours a week. Limited to five students. Sabiston, Sealy, Brown, Young, and Resident Staff

205. Surgical Aspects of Pulmonary Disorders. Student is given a more detailed study of pulmonary disease. There will be three parts to the course. The first will be clinical with assignment of one patient per week for examination and follow-up. The student will be required to search the recent literature concerning the patient's problem and include a brief summary of pertinent references with each. The second part will be concerned with clinical pulmonary function measurements in patients with pulmonary disorders and will be conducted by Dr. H. O. Sieker of the medical service. This will require two afternoons per week, four hours each. The student will be expected to participate in actual measurements of pulmonary function in patients coming to this laboratory, and will be assigned required reading relating to this phase of physiology. In the third phase the student will be assigned to the animal laboratory for four hours per week. All quarters except summer. Thirty-two hours a week. Limited to three students. Drs. Sealy, Brown, Young, and Resident

207. Surgical Cardiology. Student is introduced to the various aspects of the surgical treatment of cardiovascular disease and the course is divided into several component parts. First will come the introduction into the techniques of diagnosis, and two periods each week will be spent either in the pediatric or medical cardiovascular laboratory assisting in the clinical evaluation of patients. The student will be taught the basic concepts of extracorporeal circulation by assisting in the operating room with the conduction of open heart operations. In the second part clinical studies will be afforded by examination and follow-up of the patients. In addition, the students will be expected to carry out the various measurements of blood gases and to be familiar with these techniques. All quarters except summer. Twenty-four hours a week. Limited to two students. Drs. Sabiston, Sealy, Brown, Young, and Resident Staff

211. Alimentary Tract Surgery. Course includes a consideration of lesions of the alimentary tract which may require operation. Included are rounds, seminars, and guided reading based on patients the students care for during Basic General Surgery. Third quarter. Eight hours a week. Limited to four to twenty students. Drs. Postlethwait and

Grimson

213. Homotransplantation of Organs. Course will acquaint students with certain basic immunological aspects of homotransplantation of organs and will provide certain background information related to basic concepts in transplantation of tissues and organs. First quarter. Eight hours a Drs. Stickel and Amos

215. Surgical Diseases of Blood Vessels and Lymphatics. This course will acquaint the student with newer techniques and diagnosis and management of peripheral vascular disease, including diseases of the arteries and veins and of the lymphatics. The students will assist in the performance of such diagnostic procedures as lymphangiography and angiography. They will be assigned ward patients with these diseases and will follow such patients in the surgical outpatient clinics. First and third quarters. Three hours a week. Limited to five students. Silver and Anlyan

217. Surgery of Trauma. Course teaches the principles and practice of diagnosis and management of the acutely traumatized patient. Students will be assigned to the Duke Hospital emergency and recovery rooms and will assist in diagnosis and treatment of assigned patients with acute injuries. Lectures and seminars will be held in a coordinated plan to cover trauma of general surgery. Second and fourth quarters. Eighteen hours

a week. Limited to five students. Drs. Shingleton and Peete

219. Basic General Surgery. Course is designed to include the basic aspects of the major surgical diseases and is given at the Veterans' Administration Hospital. Patients will be assigned to the students and time provided to assist at operations. The major emphasis, however, will be on physiologic and pathologic changes, diagnosis, and the indications for operation in these diseases. Special attention will be given to those subjects in surgery common to all medical practices such as the acute abdomen. All quarters except summer. Thirty-two hours a week. Limited to ten to twenty students. Drs. Stickel, Postlethwait, Dillon, Woods, Lucas, and Resident Staff

221. Surgical Specialities. This course is designed to give a reasonably thorough study of the surgical specialties and is given at the Veterans' Administration Hospital. Ophthalmology, Otolaryngology, Neurosurgery, Orthopaedics, Plastic Surgery, and Urology are included. Patients on these services will be assigned to the students and an opportunity provided to assist at operation. Emphasis, however, will be given to diagnosis and pathophysiologic alterations. All quarters. Eight hours a week. Limited to ten to twenty students. Drs. Boyarsky, McCollum, Tindall, and Resident Staff

223. Medical and Surgical Renal Disease. Course will combine experience and instruction in medical and surgical diseases of the kidney and urinary tract, and will be taught jointly by the Division of Urologic Surgery and the Division of Medical Renal Diseases. Students will participate in the pyelonephritis clinic, hypertension clinic, and general urology clinic. Teaching rounds will embrace clinical and experimental problems in renal function, hemodialysis, renal transplantation, urinary infections, renal hypertension, obstructive uropathies, nephritides and other congenital and acquired diseases of the urinary tract which are of mutual concern to the internist and urologist. All quarters. Thirty-two hours a week. Limited to six students. *Drs. Glenn, Robinson, and Staff*

225. Investigative Urology. Students are given an opportunity to participate in an established program of urologic investigation, dealing with physiology and pathology of the genitourinary system. Both independent and integrated research will be encouraged. Methods and techniques of experimental animal surgery will be taught, and students will be afforded an opportunity to study renal, ureteral, vesical, and urinary diversion; renal hypertension; pediatric urology; and urologic endocrine-pathies. Students with interest in any area of clinical surgery are encouraged to participate. All quarters except summer. Thirty-two hours a week. Limited to four students. Dr. Boyarsky and Staff

227. Clinical Urologic Surgery. Students will participate in diagnosis and management of patients with urologic disease and in surgical treatment. Intimate association with the entire staff will be provided by incorporating students into the urologic team in the clinics, wards, and operating rooms. Cystoscopic and urographic diagnostic methods will be taught. Prerequisite: Basic General Surgery. All quarters. Thirty-two

hours a week. Limited to two students. Dr. Glenn and Staff

229. Urologic Seminar. A lecture/conference course providing an introduction to a variety of clinical problems in urology, including endocrinopathies, pediatric urology, obstructive uropathies, and urologic malignancies, to be supplemented with ward rounds and bedside teaching. Formal lectures, student participation by special reparts, clinical demonstrations, and informal conferences will be included. Second quarter. Two hours a week. Limited to eight students. Drs. Glenn, Alyea, Dees, and Anderson

231. Uroradiographic Diagnosis. Principles and techniques of radiologic diagnosis of diseases of the genitourinary tract will be taught in the Urology Clinic under working conditions, supplemented by informal lectures and conferences. Application of specialized techniques of urography, renal angiography, gas contrast studies, cystourethrography, and cineflouroscopy will be stressed, with emphasis upon the influence of these studies with regard to management and surgery. First and third quarters. Four hours a week. Limited to four students. Drs. Glenn (Urology), Lester (Radiology), and Staffs

233. Basic Neurosurgery Course. Disease conditions which are commonly encountered in a neurosurgical practice are presented. A clinical presentation of a common neurological disorder such as brain tumor and head injury is made by a member of the staff in neurosurgery. Clinical features and a plan of diagnostic investigation are stressed. The clinical

disorder is then used as a focal point from which to carry the presentation into the basic science area related to the clinical problem. For example, the neuropathologist will discuss the pathology of brain tumors after the clinical features of the condition have been covered by the neurosurgery staff. Occasionally, related clinical disciplines will discuss the clinical problem being presented. First, second, and third quarters. Two hours a week. Limited to twenty students. Drs. Odom, Nashold,

and Mahaley

235. Clinical Neurosurgery. Course is designed for those students with future interest in the neurological sciences. The student becomes in practice an extern on neurosurgery as he rotates through the neurosurgical service with essentially the same responsibilities as an intern. Duties include the work-up and care of inpatients, work-up of clinic patients, assistance in the operating room, routine postoperative care, daily rounds, and night call. The student is expected to attend the weekly conference in neurology, neuropathology, and neuroradiology, and to attend the neurosurgery lecture given to the house staff at 8:00 a.m. each Saturday morning. During this period, each student is required to write a thesis based on a clinical subject. All quarters. Thirty-two hours a week. Limited to two students. Drs. Odom, Nashold, and Mahaley

237. Investigative Neurosurgery. The student is assigned a project relating to the neurological sciences and is provided with the technical help, recording equipment, and experimental animals necessary for its completion. This course specifically will not make the student into just another laboratory assistant. Instead, each student plans and executes his own individual project, with the help of the neurosurgery staff. Laboratory space is available and clinical and experimental research projects in neurophysiology and cerebrovascular physiology are currently in progress. The student is expected to attend weekly conferences in neurology, neuroradiology, and neuropathology, and the weekly neurosurgery lecture given to the house staff at 8:00 a.m. each Saturday mornning. First, second and third quarters. Thirty-two hours a week. Limited

Drs. Odom, Nashold, and Mahaley to two students.

239. General Otolaryngology. In this clinical otolaryngology course students participate in the outpatient clinic activities and in the management of patients in the hospital. They are expected to participate in the work-up and management of patients admitted to the Otolaryngology Service and to assist in the operating room. Participation in the Otology Program acquaints the student with audiometric techniques. Diagnosis and management of head and neck cancer will be covered, and the student will attend the Head and Neck Cancer Clinic in the Division of Radiation Therapy. Each student will be required to submit a paper dealing with some aspect of Otolaryngology. This course would be especially valuable to those interested in Neurosurgery, Ophthalmology, Neurology, or Pediatrics. All quarters. Twenty-four hours a week. Limited to one or two students. Drs. Kenan and Hudson

241. Medical Audiology and Speech Pathology. Students will be working in the Hearing and Speech Clinic. Special attention will be given to advanced audiometric techniques including instruction in the use of the Bekesey and PGSR audiometry. Emphasis will also be placed on vestibular mechanisms and testing. The student will also spend some time with the speech pathologist observing methods diagnosis and management of the various speech problems. Contact with clinical Otolaryngology will be maintained. All quarters. Twenty hours a week. Limited to one or two students. Mr. King and Mr. Massengill

243. Otolaryngology Lecture Series. One or two hour a week lecture series covering general otolaryngology, with the emphasis on clinical aspects. This will be entirely a didactic lecture course, and at the conclusion an examination will be given. This lecture course will be essentially the same course as offered now to senior students. All quarters

except summer. One hour a week. Drs. Hudson and Kenan

245. Reconstructive Plastic Surgery. Course will give the interested student a concentrated course in reconstructive surgery—(the equivalent of an intern) operating, emergency, and dressing rooms and clinics—private and public ward assignments, lectures, and demonstrations. This course would include patients with the following conditions: congenital malformations of the face, hands, and rectogenital systems; acute facial and peripheral trauma; burns; paraplegics; esthetic surgery; cancer of the face, oral cavity, and neck, and reconstructive surgery following trauma and disease. All quarters. Thirty-two hours a week. Limited to one student. Drs. Pickrell, Georgiade, and Plastic Surgery Staff

247. Physiology and Bacteriology of Healing Wounds. Course is designed for the student who is interested in the physiology and bacteriology of healing wounds. The student is assigned to the dressing rooms daily, Monday through Friday, where he has an abundant opportunity to study the bacteriology and physiology of healing wounds, acute trauma, following excisional surgery, and following many types of grafting and reconstructive procedures. The effects of various antiseptics and local applications of emollients could be studied in conjunction with their possible bacteriocidal or bacteriostatic effects. All quarters. Twenty hours a week. Limited to one student: Drs. Pickrell, Georgiade, and

Plastic Surgery Staff

249. Speech and Hearing Problems in Children with Clefts of the Lip and Palate. The student interested in speech and hearing problems in children, especially as they relate to children with clefts of the lip and palate, is given an abundant opportunity to learn and work in the Speech and Hearing Laboratories and the Child Guidance Clinic. Methods of evaluation, testing, and remedial measures will be studied thoroughly. All quarters except summer. Fifteen hours a week Limited to one stu-

dent. Mr. Massengill (Speech); Dr. Hudson and Mr. King (Audiology); Drs. Quinn and Wentz (Orthodontics); Drs. Pickrell, Georgiade,

and Staff (Plastic and Reconstructive surgery)

251. Anesthesiology. Course introduces student to surgical anesthesia, diagnostic and therapeutic blocks, cardiopulmonary resuscitating, and the treatment of acute and subacute respiratory problems. Prerequisites: Pharmacology and Physiology. All quarters. Thirty-two hours a week. Limited to one or two students. Drs. Dent, Hall, Vartanian, and Ferrari

253. Anesthesiology Research. Course teaches techniques utilized in clinical and laboratory research in anesthesiology. In collaboration with the faculty, the student will work on a research project related to the physiology of pharmacology of anesthetic practice. A wide range of facilities is available for the measurement of respiratory and circulatory parameters, both in animals and in man. All quarters. Thirty-two hours a week. Limited to two students. Dr. Hall

255. Medical Speech Pathology. Course will emphasize diagnostic and rehabilitation treatment used with the patients who will be seen in the Medical Center. The following conditions will be reviewed: articulation disorders, delayed speech development, cleft palate, stuttering, voice disorders, aphasia, cerebral palsy, language disorders, mental retarded speech, lisping, oral inaccuracy, laryngectomy, and other disorders of speech not falling under one certain category. The role the physician plays in the total rehabilitation of the speech-impaired patient will be stressed. All quarters except summer. Twelve hours a week. Limited to Mr. Massengill two students.

257. Research in Medical Speech Pathology as Applied to Reconstructive Plastic Surgery. Course is designed to present a composite analysis of research techniques used by the speech pathologist with reconstructive plastic surgery patients who possess organic speech problems. Certain emphasis will be placed on cinefluorographic investigation and speech results achieved by different surgical procedures. The use of different speech appliances will also be reviewed. The course will deal with the organization and administrations of speech pathology research programs coordinated with reconstructive surgery departments. All quarters except summer. Twelve hours a week. Limited to two students. Massengill

259. General Orthopaedics. Course is a comprehensive introduction to Orthopaedic Surgery designed primarily to broaden the student's understanding of the specialty. It consists of full or part-time experience in the Orthopaedic service, daily contact with the staff and house officers, and duties similar to those of the junior intern including care of inpatients, outpatient experience, and work in the operating room. The student attends all conferences and rounds, has an opportunity to visit with staff members at the State Crippled Children Clinics in various areas of

North Carolina, and to observe the participation of the State and local Health and Welfare Departments and Vocational Rehabilitation Counselors in a well-established rehabilitation program with close personal contact of those participating with each agent fully familiar with the problems. The overall purpose of the course is to develop a broad concept of Orthopaedics, particularly for those students planning a career in general practice or Pediatrics, to teach practical techniques to those students interested in allied surgical specialities, and to give those students interested in Orthopaedics as a specialty an opportunity to evaluate all phases of such a career. All quarters. Twenty-four hours a week. Limited to four students. Orthopaedic Staff

261. Office Orthopaedics. Includes outpatient Orthopaedic problems, patient examination, disability evaluation, on the management of compensation-liability problems, and establishment of medico-legal contact with emphasis on record-keeping and office management. All quarters. Twelve hours a week. Limited to four students. Associated Staff in

practice in Durham and Duke Staff

263. Orthopaedics in the Community Hospital. Course is similar to those mentioned earlier, with more emphasis on the private practice of Orthopaedics, especially as an office consultation service in a community including the coordinating of office practice, emergency room, and hospital services. This course is conducted in the offices of the Associate Orthopaedists in Durham and at Watts and Lincoln Hospitals. All quarters. Eighteen hours a week. Limited to four students. Drs.

Bugg, Glasson, Coonrad, and Kapoor

265. Cerebral Palsy. Opportunities are available in this field for clinical experience and laboratory investigation in cerebral palsy and general children's Orthopaedics. The course is given at the North Carolina Cerebral Palsy Hospital and the Duke University Medical Center. Students participate in rehabilitation and occupational therapy and diagnostic conferences and rounds, with opportunity to observe psychological evaluation of the handicapped and the handling of family problems. In addition, the student observes and assists in the surgical care, bracing, and rehabilitation of these patients. All quarters except summer. Eighteen hours a week. Limited to two students. Orthopaedic Staff

267. Clinical Conferences in Cerebral Palsy. Conferences are arranged for the benefit of students primarily interested in neurological diseases, Pediatrics, and related fields. This part-time opportunity is available throughout the year, 11:00 a.m. to 12:00 noon on Mondays and 10:00 a.m. to 12:00 noon on Wednesdays at the North Carolina Cerebral Palsy

Hospital. Drs. Baker, Bassett, and N. C. C. P. H. Staff

269. Surgery of the Upper Extremity. Course will include a general or particular study of conditions affecting the entire upper extremity. For example, the hand may be studied as evidence of systemic disease or from the viewpoint of hand deformities after trauma, congenital defects

of the extremity or the extremity as affected by arthritis. Prerequisites: Anatomy and Physical Diagnosis. All quarters. From nine to thirty-two hours a week. Limited to four students. *Drs. Goldner, Clippinger, McCollum, and Bassett*

271. Orthopaedic Aspects of Arthritis. Includes clinical experience in adult and children's rheumatology with the Department of Medicine. The student attends rheumatology conferences, rounds, and clinic. Opportunity is available for investigative work through the rheumatology program. (See Rheumatology under Medicine.) Surgical experience can be arranged through Dr. McCollum. All quarters except summer. Twelve hours a week. Limited to four students. Drs. McCollum,

Goldner, and Medical Rheumatology Staff

273. Athletic Medicine. Course stresses importance of the care of playground, high school, and college athletic injuries. The course content, although dealing with Orthopaedic and traumatic problems, is directed at preparing doctors who plan to practice general medicine or surgery and think they would enjoy participating in their community's school programs. In addition to the specific orthopaedic and traumatic therapy, lectures and experience in conditioning dieting, protective equipment, and prevention and care of athletic injuries, will be included. Practical experience will be available in the training rooms of the Duke University Department of Athletics and on the athletic fields at the University and the local high schools. First, second, and third quarters. Sixteen hours a week. (Approximately three afternoons a week, plus Friday evenings and Saturday afternoons.) Limited to two students. Dr. Baker and the Orthopaedic Staff

275. Electromyography. Course is an introduction to electrodiagnostic techniques and theories and practice of clinical electromyography. It consists of lectures and patient and laboratory demonstrations. Individual projects directed at the study of specific diseases of the neuromuscular system may be arranged. All quarters except summer. Four hours a week. Limited to four students. Drs. Clippinger and Goldner

277. Research in Orthopaedics. Course gives the student an opportunity to spend part or full time in laboratory investigation or clinical research in Orthopaedics and related fields. In the main it will consist of individual projects with experience in investigations currently in progress in Orthopaedics at the Medical Center, Veterans Administration Hospital, and the North Carolina Cerebral Palsy Hospital. All quarters. Eight hours a week. Limited to four students. Orthopaedic Staff

279. Rehabilitation of the Amputee. Course directs the student's training at developing a full knowledge of the basic principles of amputation, postoperative care, and psychological adjustment, through weekly Amputee Clinics at the Duke University Medical Center, the Durham Veterans Administration Hospital, and the Veterans Administration Regional Office in Winston-Salem. Special training is offered in the

mechanics of prosthetics, their manufacturing, and instruction in prescription, fitting, and theories of their use. All quarters. Eight hours a week. Limited to four students. Drs. Goldner and Clippinger, Mr. Titus, Miss Kaiser, and the Duke Prosthetic Shop and Physical Therapy Staffs

281. Introduction to Fractures. Course offers the student an opportunity to participate in the emergency and follow-up care of fractures at the Duke Medical Center and Watts and Lincoln Hospitals, where, by special arrangement, he may be on emergency call. In addition, he attends and participates in Fracture and Plaster Clinics and ward rounds, at the Medical Center on Friday mornings and at Watts Hospital on Saturday mornings. Extent of participation by special arrangement. All quarters. Time is flexible. Limited to four students. Medical Center

and Watts Hospital Orthopaedic Staffs

283. Children's Orthopaedics. Course offers an orientation to the basic problems associated with congenital abnormalities and other problems of the musculoskeletal system of the child. Experience with children from infancy to adolescence is available. The depth of teaching and experience can extend from observation a few hours a week to a full externship. Prerequisites: Anatomy, Physiology, Pathology, Chemistry, Pediatrics, Physical Diagnosis, Medicine, and Introduction to Surgery. All quarters. Time flexible. Limited to four to eight students. Orthopaedic Staffs of Duke Hospital, Watts Hospital, and North Carolina Orthopaedic Hospital, Durham, N.C., and Shriners' Hospital for Crippled Children, Greenville, S.C.

208. Rehabilitation Medicine. Course is offered during the fourth year when students are familiarized with public and private resources. Students work closely with paramedical personnel in the overall therapy and discharge planning of severely disabled patients and are encouraged to attend the Rehabilitation Evaluation Clinic which meets twice monthly. All quarters. Twenty hours a week. Limited to one or two

students. Dr. Gregg



Health Related Professions

Cytotechnology

Assistant Professor W. Johnston, *Director*; Assistant Professor M. Vazquez, *Assistant Director*; Instructor J. Amatulli; and Staff of Department of Pathology as required in special phases of instruction.

The School of Cytotechnology at the Department of Pathology offers a twelve-month course in technical and diagnostic aspects of exfoliative cytology to qualified individuals. The minimum qualifications are twelve semester hours of Biology, which may include Anatomy, Histology, Zoology, Botany, and Physiology, and at least two years of college. The common practice is to admit individuals with B.S. or A.B. degrees and only in exceptional cases applicants with incomplete college requirements will be considered.

The program consists of two parts. Part I—six months, primarily theoretical and practical exercise in the techniques of exfoliative cytology and interpretation of the clinical material. Part II—six months practical training in all aspects of exfoliative cytology in participating in the routine work of the laboratory. One class is accepted annually on November 1. Graduates of this course are awarded a certificate and are eligible to take the certifying examinations given by the Registry of Medical Technologists of the American Society of Clinical Pathologists. There is no tuition fee. Additional information about the School of Cytotechnology and ap-

plications for admission may be obtained from William Johnson, M.D., Department of Pathology, Duke University Medical Center, Durham, North Carolina.

Dietetics

Director D. Tate; Educational Director M. McLachlan; Assistant Director M. Pate; Administrative Dietitians V. Murphy, N. Curtis; Administrative and Therapeutic Dietitian C. Conely; Unit Administration Dietitian J. Burleigh; Maternal and Child Health Dietitian R. Stoner; Medical Dietitians B. Hensley, J. Hunter, D. Honeycutt, C. Peters; Clinic Dietitian C. Wason; Research Dietitian V. Irons; Special Projects Dietitian T. Burgess; Teaching Dietitian J. Graham

A Dietetic Internship Program is offered to men and women who have graduated from college in Food and Nutrition or Institutional Administration and meet the course requirements of the American Dietetic Association. The twelve months of post-baccalaureate work consists of classroom instruction and clinical experience in administration, therapeutics, research, and education. After the successful completion of the Dietetic Internship, certificates and membership into the American Dietetic Association are awarded. For further information write:

Department of Dietetics Duke University Medical Center Durham, North Carolina

Hospital Administration

Professor R. Brown, *Director*; Assistant Professor D. S. Smith, *Coordinator*; Professor C. Frenzel; Associate Professor L. Swanson; Clinical Associate M. Pickens

Clinical Lecturer E. C. Bryson; Instructors R. Jennings, R. Bindewald, C. Cobb; Clinical Instructors J. Felts, G. Harris, H. Rowland, B. McCall; Clinical Preceptors W. Andrews, J. Barnes, H. Bettis, T. Howerton, J. Moulton, J. Pyne, M. Yount

Graduate education for hospital administration is offered through a 24-month program conducted jointly by the Graduate School of Arts and Sciences and the Medical Center. The Program consists of selected graduate courses in Economics, Political Science, Sociology, and Hospital Administration, and of a twelve-month administrative residency in hos-

pitals and other health agencies. The Master of Hospital Administration degree is awarded to those who successfully complete the Program.

Detailed information may be obtained from:

Graduate Program in Hospital Administration Box 3018 Duke University Medical Center Durham, North Carolina

Medical Technology

Professor T. Kinney, *Director*; Professor R. Thiers; Associate Professors S. Osterhout, J. Goodrich, A. Musser; Assistant Professors H. Silberman, G. Spooner; Associate C. Mauney

Instructors R. Habig, P. Smith, C. Harrison, S. Schrack, M. Garriss, A. Proctor, N. Lester, M. Harris, J. Pickett, C. Church, E. Bumgarner, I. Wyatt

The School of Medical Technology offers a twelve-month internship program of instruction and rotation through the clinical laboratories of the Duke University Medical Center and the Veterans Administration Hospital.

The internship program is open to men and women who have either a baccalaureate degree or a minimum of three years of college (in an accredited college or university) with plans for receiving such a degree from the preparatory college upon completion of the internship program. Applicants must have successfully completed at least 90 semester (135 quarters) hours which include:

Chemistry—minimum of 16 semester hours (24 quarter hours) which includes one full year of general college Chemistry. The remaining courses may be selected from qualitative, quantitative, organic, physical, or biochemistry. (One semester of quantitative analysis is strongly recom-

mended.) All courses must include lectures and laboratories.

Biological Sciences—minimum of 16 semester hours (24 quarter hours). All required biological sciences must include lecture and laboratories. Courses may be selected from general Biology, Zoology, Botany, Physiology, Comparative Anatomy, Parasitology, Histology, Histologic Technique, Genetics, or Bacteriology. (Bacteriology is strongly recommended.)

Mathematics-minimum of 3 semester hours.

Courses in Physics are recommended but not required. Electives may be selected from English, social sciences, arts, and Humanities.

Courses taught during the Internship include Clinical Biochemistry, Clinical Microscopy, Radioisotope Theory, Microbiology (Bacteriology,

Mycology, Virology), Immunohematology, Parasitology, Introduction to Clinical Pathology, Serologic Techniques and Histologic Techniques.

(Classes begin on July 1.)

Students are given a certificate upon completion of the Internship program and are qualified for examination and certification by the Registry of Medical Technologists of the American Society of Clinical Pathologists. They are eligible for membership in the American Society of Medical Technologists. This program is approved by the Council on Medical Education and Hospitals of the American Medical Association.

A \$25.00 non-refundable registration fee is required upon acceptance in the program. This is applied towards the \$50.00 breakage fee which is payable upon entrance. Students will be furnished rooms in dormitories and will receive a grant-in-aid of \$100 a month. Students are required to participate in the Hospital Insurance plan, furnish their own white uniforms, white shoes, and meals. Laundry of uniforms is furnished by the Medical Center. Students can expect to spend \$50 to \$75 for books during the year.

For further information and/or application blanks, write to: Registrar, School of Medical Technology, Department of Pathology, Duke Univer-

sity Medical Center, Durham, North Carolina 27706

Nuclear Medicine

Professor R. Lester, Chairman of the Department of Radiology; Associate Professor J. Goodrich, Director of Nuclear Medicine Division; Professors R. Reeves, G. Baylin; Associate Professors P. Cavanaugh, A. Sanders; Assistant Professor R. Gorten; Associate A. Wyrick

Instructor K. Sharpe; Radiological Safety Officer C. Knight

The Division of Nuclear Medicine offers thirteen-week and twelvemonth programs of instruction and laboratory training for clinical radioisotope technologists. This training includes experience by rotation through the Radiation Safety Office and the following Divisions of the Department of Radiology: Nuclear Medicine, Radiation Therapy, and Radiobiology.

An applicant for admission must be a graduate of an approved high school and registered by the American Society of Radiologic Technologists or the Registry of Medical Technologists (ASCP). Applicants having equivalent training and experience will be considered on an individual basis. A registration fee of \$100 is required, upon acceptance, and is payable to the Division of Nuclear Medicine, Duke University. Books and supplies are about \$25.00. No living quarters are provided for paramedical students by the University. Students live in town at their own expense. Completion of the one year program qualifies the participant

for examination leading to the registry of American Society of Radiologic Technologists. Participants in the thirteen-week course may qualify for this registry by pursuing on-the-job isotope technology in any institution having a clinical radioisotope laboratory. For further information address inquiries to:

Mrs. Kathryn Sharpe, Instructor in Radiology (Division of Nuclear Medicine) Box 3166 Duke University Medical Center Durham, North Carolina 27706

Nurse Anesthesia

Professor Sara J. Dent, Chief of Division of Anesthesiology; Instructor M. Campbell, Director of School of Anesthesia for Nurses; M. Gardner, Educational Program Director; Assistant Nurse Anesthetists L. Glenn, F. Perry, A. Truitt, M. Haigler, A. Moody, G. Cowan, F. Ivey, R. Johnson

The twenty-four month course in anesthesia is available to well qualified registered nurses. Instruction embraces the theoretical aspects and clinical application of all drugs and techniques in accepted usage. The program is divided into quarters. The major part of the basic theoretical instruction is given during the first three quarters. After a preclinical period of eight weeks, clinical practice runs parallel with the theoretical program. One class is accepted annually and enrolled in January. All appointments of the current year are made by September 1 of the preceding year. Graduates of this course are eligible to take the qualifying examination for membership in the American Association of Nurse Anesthetists. Tuition is \$150.00. Additional information concerning nurse anesthesia may be obtained from Mary B. Campbell, C.R.N.A., P.O. Box 3204, Duke University Medical Center, Durham, North Carolina.

Physical Therapy

Associate Professor H. Kaiser, Director; Associate G. Horton; Supervisor of Treatment Division; I. Parrish, Coordinator of Extension Services; A. McCallum, Secretary-Recorder; P. Allen, Acting Educational Coordinator; B. Baker, Assistant Supervisor; Associates E. Blumenthal, J. Riebel

Instructors E. Villanueva, S. Espenshade, J. Hampton; Assistants G. Hart, J. Roe, J. Griffin, M. Clendenin, G. Hutcheson, W. Honeycutt; Visiting Trainee S. Barnish

The curriculum in Physical Therapy is conducted under the joint auspices of the Graduate School of Arts and Sciences and the Medical Center.

Two programs are offered. One leads to a Certificate in Physical Therapy and a Master of Arts degree and the other to a certificate. Graduates of either program are eligible for state and national licensing and registration examinations and membership in the American Physical Therapy Association.

Prerequisites for both programs are basic courses in Psychology, Mathematics through Trigonometry, and one year laboratory course in Chemistry, a biological science exclusive of Botany, and Physics covering the principles of heat, mechanics, and electricity and satisfactory scores on the Graduate Record Examination. Those wishing to enter the program leading to a Master of Arts degree must also meet the requirements of their selected major as well as have successfully completed a course in Calculus and additional Chemistry courses. Those seeking admission to the program leading to a Certificate in Physical Therapy must have completed a baccalaureate degree or plan to receive such a degree from the preparatory college upon completion of the physical therapy program.

The program leading to a Certificate in Physical Therapy and a Master of Arts degree is a two year program. In the first year the necessary credit courses may be selected from the following: Anatomy M201, 6 units; M202, 3 units; M203, 4 units; M205, 2 units; M313-314, 2 units; Physiology M261-262, 8 units; M279, 1 unit; M370, 2 units; M372, 3 units; Psychology S232, 3 units; Biochemistry 201, 6 units; Zoology 252, 4 units; 245, 3 or 4 units; 271, 4 units. In the second year, in addition to the thesis, the physical therapy procedure courses listed in the Certificate Program and practicum may be completed. Upon completion of the two year program, a Certificate in Physical Therapy and a Master of Arts degree are awarded.

The program leading to a Certificate in Physical Therapy may be completed in fifteen months. The curriculum includes: basic science courses, kinesiology, Pathology, Physical Therapy, and rehabilitation as related to the medical and surgical specialties, administration, ethics, physical therapy procedure courses, and sixteen weeks of clinical experience at the Duke University Medical Center, affiliated hospitals and state and county public health departments.

Tuition and health fees for the program leading to a Certificate in Physical Therapy and a Master of Arts degree is approximately \$1,800. The total cost for the program leading to a Certificate in Physical Therapy is approximately \$1,200. Scholarship and loan funds are available.

For further information, write to the Director of Physical Therapy, Box 3247, Duke University Medical Center, Durham, North Carolina, 27706.

Prosthetic and Orthopaedic Appliances

Assistant Professor B. Titus, *Director*; Assistant Prosthetist and Orthotist R. Gooch; Assistant Orthotist P. Ray

The function of this Department is to produce prosthesis and orthopaedic appliances for the medical profession. Facilities for individual training in specific techniques or methods employed by this Department are available. Those who complete four years' training are eligible to take the examination of American Board of Certification.

Radiologic Technology

Professor R. Lester, Chairman of the Department of Radiology; Assistant Professor J. Cahoon, Director of the School of Radiologic Technology; Professors R. Reeves, G. Baylin; Associate Professors W. Barry, M. Capp, J. Goree, B. Worde, P. Cavanaugh; Assistant Professors M. Raben, A. McCrae, R. Rice

Instructor J. Miller; Technical Instructors M. Lockhart, E. Porter, G. Cheshire, T. Christianberry, V. Moody, M. Ahbe; Radiological Safety Officer C. Knight

The School of Radiologic Technology offers a two year training program of instruction and practical training in the Department of Radiology.

Students are admitted on September 1 of each year for two years of intensive training in the academic and practical aspects of Radiologic

Technology.

During the second year the students are paid a stipend of \$100.00 per month. Upon completion of the course, the students are required to take the National Board Examinations in Radiologic Technology sponsored by the American Registry of Radiologic Technologists before a diploma is awarded. The school is approved by the Council on Education of the American Medical Association, the American College of Radiology, the American Registry of Radiologic Technologists, and the American Society of Radiologic Technologists.

Candidates for admission must be graduates of approved high schools and rank in the *upper third* of their class. Candidates with college credits are given preference. Official transcripts of high school and/or college grades, a list of three references, and a recent photograph must be included with the application before being considered by the Committee on Admissions. It is recommended that applicants be at least 19 years

and not more than 30 years of age at the time of enrollment.

A tuition of \$100.00 payable to the Treasurer of Duke University is required and is payable by August 15. There is a \$2.00 application fee

payable to the School of Radiologic Technology. Application fee and tuition are non-refundable. Books, supplies, and uniforms run about \$175.00. Laundry of uniforms is furnished by the Medical Center. After successful completion of the first year, the student is paid a monthly stipend of \$100.00.

At the end of six months, if the student's work has been unsatisfactory or shows inaptitude for technical work in radiologic technology, he is

advised to withdraw from the course.

No living quarters are provided for paramedical students by the University and the students in Radiologic Technology live in town at their own expense. For further information or application blanks, write to John B. Cahoon, R. T. Director, School of Radiologic Technology, Duke University Medical Center, Durham, North Carolina.

Veterinary Medicine

Associate Professor J. LeMay, Chairman; Associates B. Sherwood, R. Castellanos

The function of this Department is to facilitate the various teaching and research programs that require laboratory animals. Veterinary medical consultation is provided for research projects in which experiments are conducted on animals. Assistance is made available in selecting the most suitable species or strain of laboratory animal to use in a given study. In addition, animals are procured, quarantined, and appropriately conditioned in order to provide a highly reliable biological tool. A wide variety of technical services are carried on, such as providing whole blood of a variety of species, collecting biological specimens, providing clinical pathologic examinations, preparing animals for surgery, postsurgical care, and maintenance of the animal colonies.

The Department collaborates with those departments of the School of Medicine that utilize laboratory animals in their teaching programs. Various disease states are experimentally produced in animals for student observation and study, and techniques for collecting biological specimens for additional study are demonstrated. Aid is given in setting up and carrying out these demonstrations and studies on animals.

A postdoctoral training program in laboratory animal medicine has been initiated and plans are under way to increase the number of avail-

able training positions.

Although the Department is in an early stage of development, research is under way on some of the spontaneous diseases of laboratory animals.

Roster of Students

Class of 1970

Aksel, Sezer (Duke), Izmir, Turkey Alpert, Eric David (Dartmouth), New Bedford, Massachusetts Angelillo, John Charles (St. Louis), Durham, North Carolina Austin, Thomas Edward (Univ. of Florida), Umatilla, Florida Ayars, Paul Kenneth, Jr. (Dartmouth), Bridgeton, New Jersey Baggs, William Jerold (Duke), Reston, Virginia Ball, John Robert (Emory Univ.), Auburn, Alabama Ballenger, James Caudell (North Carolina at Chapel Hill), Raleigh, North Carolina Black, Edward Barnwell (Univ. of the South), Greenville, South Carolina Boaz, David Earnhardt (Pennsylvania State Univ.), Gainesville, Florida Bost, Ronald Eugene (Univ. of Maryland), Temple Hills, Maryland Busby, Merle Rudy (Johns Hopkins), Salisbury, North Carolina Campbell, Carlos Clinton, III (Haverford), Knoxville, Tennessee Cato, Allen E., Jr. (Duke), Durham, North Carolina Caughey, Dale Wells (Bucknell), Binghamton, New York Clark, Arthur Watts, Jr. (Davidson), Durham, North Carolina Coleman, Michael Dortch (Univ. of Arkansas), Memphis, Tennessee Comiter, Henry Joseph (Alfred), New York Conetta, Donald Anthony (New York Univ.), Stamford, Connecticut Corless, Joseph Michael (Georgetown Univ.), North Bergen, New Jersey Everhart, Floyd Richard, Jr. (Princeton), West Palm Beach, Florida Forth, Paul Taber, Jr. (Duke), Roanoke, Virginia Ghanem, Elias Farid (North Carolina at Charlotte), Haifa, Israel Gill, Howell Harley (Gettysburg), River Edge, New Jersey Gold, Philip William (Duke), Newport News, Virginia

Gordon, Robert (Brandeis), Coral Gables, Florida Goscin, Stephen André (Princeton), Richardson, Texas Green, Linda Darlene (Rice), Falls Church, Virginia Gwynne, John Thomas (Princeton), Morgantown, West Virginia Harrison, Thomas Edward (Tufts Univ.), Line Lexington, Pennsylvania Hawkins, Hal Kenneth (Rice), Bartlesville, Oklahoma Head, Harold David (Washington and Lee), Lexington, Virginia Horton, John Andrew (Columbia), Harrison, New York Hybarger, Charles Patrick (Duke), Beltsville, Maryland Jeffords, Dexter Lee (Duke), Roslyn, New York Jenkins, Ewin Burrow (Univ. of Tennessee), Knoxville, Tennessee Jones, Edwin Lee, III (Duke), Charlotte, North Carolina Karlin, Jan Victor (Harvard), Waterbury, Connecticut Kelly, Gregory Allen (Vanderbilt), Knoxville, Tennessee Kelly, James Reginald (Univ. of South Carolina), Columbia, South Carolina Kinney, Thomas Roberts (Duke), Durham, North Carolina Kizer, John Stephen (Princeton), Charleston, West Virginia Krackow, Kenneth Alan (Johns Hopkins), Durham, North Carolina Kutner, William Alvin (State Univ. of New York Coll. at Fredonia), Dunkirk, New LeBance, Michael John (Drexel Inst. of Tech.), Philadelphia, Pennsylvania Lawlor, Patricia Kay (Reed), Oakland, California Lewis, Barnett William (Davidson), Lakeland, Florida Marchand, Anthony (Univ. of Connecticut), Greenwich, Connecticut Marotta, Charles Anthony (City Coll. of New York), New York, New York Marusov, Paul Nicholas (Rice), Verona, Pennsylvania Mason, Janet (Mount Holyoke Coll.), Orange, New Jersey Maw, Gilbert Maylon (Univ. of Utah), Salt Lake City, Utah McGuffin, William Lewis, Jr. (Georgia Inst. of Tech.), Greeneville, Tennessee Miller, James Alan (Ohio), Charleston, West Virginia Miller, Joseph Paul (Hull), Beaumont, Texas Miller, Walter Luther (Massachusetts Inst. of Tech.), Nazareth, Pennsylvania Mohl, Paul Cecil (Harvard), South Orange, New Jersey Needel, Norman Howard (Rutgers), West Hyattsville, Maryland New, William, Jr. (Stanford), Hillsborough, California O'Neill, William Mansfield, Jr. (Univ. of California), Albuquerque, New Mexico Palko, Daniel Bernhardt (Brown), Passaic, New Jersey Pease, Howard Francis (Bowdoin), New Milford, Connecticut Pizzo, Salvatore Vincent (St. Joseph's Coll.), Philadelphia, Pennsylvania Reiley, Thomas Trevor (Purdue), Cincinnati, Ohio Reynolds, Charles Philip, III (Purdue), Lake Forest, Illinois Scales, Susan Margaret (Rice), San Francisco, California Schmits, Walter Richard, Jr. (Univ. of Rochester), Demarest, New Jersey Schostal, Clifford J. (Univ. of Rochester), Livingston, New Jersey Shelburne, John Daniel (North Carolina at Chapel Hill), Raleigh, North Carolina Silver, Carol Diana (Univ. of Richmond), Richmond, Virginia Smith, Forrest Owen (San Francisco State Coll.), Aliquippa, Pennsylvania Smith, Harold A., Jr. (Colgate Univ.), Marlton, New Jersey Smith, William Thomas (Hiram), Warren, Ohio Sohn, Stephen Allan (Harvard), Newton, Massachusetts Somers, William Robert (Duke), Oak Ridge, Tennessee Stead, Nancy White (Duke), Durham, North Carolina

Waite, Robert Sears (Duke), Atlanta, Georgia

Tucker, William Kirkby (Johns Hopkins), Chevy Chase, Maryland

Walker, Margaret Bates (Duke), Durham, North Carolina Waterbor, Robert Bertram (Harvard), Fairless Hills, Pennsylvania Weintraub, Ronald Barbour (Johns Hopkins), Frederick, Maryland

Class of 1969

*Allen, David Williams (Duke), Durham, North Carolina Ayer, Frederick, III (Harvard), So. Hamilton, Massachusetts Bierfeld, James Louis (Duke), Highland Park, Illinois Boylston, James Alan (U. of S.C.), Columbia, South Carolina Budd, Daniel Claude (Rutgers), Hillsdale, New Jersey Carmalt, E. Duane (Johns Hopkins), Ft. Lauderdale, Florida Chang, Jack Han-Teh (Duke), New York., New York Cheek, Jack Allan, Jr. (U. of N.C.), Greensboro, North Carolina *Cohen, Harvey Joel (Brooklyn College), Durham, North Carolina Cook, Jay David (Purdue), Hammond, Indiana Crowe, John Kenyon (Earlham), Cape Girardeau, Missouri Cruikshank, Dwight Phelps, IV (Duke), Parkersburg, West Virginia Davis, Arthur Brian (N.C. State Univ. at Raleigh), Raleigh, North Carolina deVito, Peter Carl (Princeton), Glen Ridge, New Jersey Dixon, Richard Hoyt (Bowdoin), Belmont, Massachusetts Dunn, Neil Marshall (Carleton College), Kingsville, Texas Elson, Melvin Leslie (Univ. of Tenn.), Chattanooga, Tennessee English, Thomas Leon (Yale Univ.), East Point, Georgia Entmacher, Michael Samuel (Franklin & Marshall), Levittown, New York Fauntleroy, Thomas Waring, Jr. (Washington & Lee), Coraopolis, Pennsylvania Foster, Charles Stephen (Duke), Durham, North Carolina Fox, James Wesley (Stanford Univ.), Carmichael, California Gellar, Richard (Columbia), Brooklyn, New York Gentzler, Richard David, II (Franklin & Marshall), Spring Grove, Pennsylvania Gervin, Alfred Spencer (Milligan), Emory, Virginia Giles, Harlan Raymond (Duke), Avondale Estates, Georgia Goldberg, Bertram (U. S. Military Academy), Melrose Park, Pennsylvania Grimson, Baird Sanford (Washington & Lee), Durham, North Carolina Gruenwald, Charles (Indiana Univ.), Martinsburg, West Virginia Haberkern, Roy Conrad, III (Haverford College), Garden City, New York Hagan, Mary Jeannette (Bucknell Univ.), Ankara, Turkey Henderson, Richard Albert, Jr. (Sacramento State), Fair Oaks, California Hill, David Peter (Wheeling), Wheeling, West Virginia °Hoffman, Philip Guthrie, Jr. (Rice), Houston, Texas Hoover, Eddie Lee (U. of N.C.), Charlotte, North Carolina Horten, Bruce Carl (Drew), Fort Mill, South Carolina Jackson, Don Jobe (Univ. of Tenn.), McKenzie, Tennessee Jenkins, James Hobart (Southern Ill. Univ.), Urbana, Illinois Johnson, James Fred (George Wash. Univ.), Washington, D. C. Karsh, Richard Bruce (Williams), East Rockaway, New York Kernodle, Harold Barker, Jr. (Davidson), Burlington, North Carolina Kirkpatrick, Douglas Bernard (Oberlin College), Yellow Springs, Ohio Koff, Stephen Andrew (Duke), Long Beach, New York Lawrence, Dale Nolan (U. of Cincinnati), Cincinnati, Ohio Levie, Benton Bains (Vanderbilt), Albertville, Alabama

^{*}Leave of absence.

Levy, Steven Ted (Queens College), Forest Hills, New York Lonon, Robert Warren, Jr. (Duke), Charlotte, North Carolina Malone, Charles Bruce, III (Harvard), Arlington, Texas Marafioti, Richard Lynn (Harvard), Rochester, New York Marger, Donald (Duke), Miami, Florida Masters, Stuart Jeffrey (Hamilton), Roslyn Heights, New York Megna, Daniel (Duke), Staten Island, New York Meyer, Alan Howard (Duke), Great Neck, New York Moore, Dan Cockrill (Duke), Memphis, Tennessee Moorefield, William Guerrant, Jr. (Duke), Durham, North Carolina Morawetz, Richard Bacon (Emory), Marietta, Georgia Newman, Larry Bernard (Univ. of Pa.), Memphis, Tennessee Pfautz, Carolyn June (Houghton College), Tarentum, Pennsylvania Ramsey, Maynard, III (Emory), Tampa, Florida Remigailo, Richard Vladimir (Duke), Arlington, Virginia Rienstra, Joseph Douwe (Duke), Arlington, Virginia *Rogol, Alan David (Massachusetts Inst. of Tech.), Seymour, Connecticut Rose, Diane Janice (Smith), Wantagh, New York Rosenbaum, David H. (Brown), Brooklyn, New York Rowe, Vernon Dodds, III (Duke), Hendersonville, North Carolina Rummo, Nicholas John (Dartmouth), Brooklyn, New York Rundles, Charlotte (Duke), Durham, North Carolina Sander, Carol Marlene (Cornell), Penfield, New York Smith, Charles Donovan (Princeton), Memphis, Tennessee Tremaine, Myron David (U. S. Naval Academy), Fayetteville, North Carolina Utley, Henry Griffith (Duke), Durham, North Carolina Valiant, Martha Eloise (Univ. of Miami), Durham, North Carolina Valle, David Lee (Duke), Durham, North Carolina Volberg, Frank Marshall, Jr. (Duke), Kingsport, Tennessee Waggoner, David Michael (Duke), Grosse Point, Michigan *Wexler, John Paul (Hobart), Brooklyn, New York Whitfield, Richard Wriston (Harvard), Greenwich, Connecticut Williams, Randal James (Stetson), Ft. Myers, Florida Wise, Thomas Nathan (Dartmouth), Washington, D. C. Zavelson, Thomas Michael (Duke), Mansfield, Ohio

Class of 1968

Arons, Michael James (Yale), Stamford, Connecticut
Atkinson, John Pepper (Emory), Macon, Georgia
Baylin, Stephen Brucc (Duke), Durham, North Carolina
Bickers, Peter Warren (U. of So. Fla.), Tampa, Florida
Block, Michael Allen (Princeton), Irvington, New Jersey
Brickman, Martin James (Bates Coll.), Marblehead, Massachusetts
Carlton, Bruce Ronald (N.Y.U.), Great Neck, New York
Chotiner, Gerald (Duke), McKeesport, Pennsylvania
Cook, Joseph William, Jr. (Duke), Charlotte, North Carolina
Crosson, Ann Ward (Randolph-Macon Woman's Coll.), Charlotte, North Carolina
Damiano, Richard Ernest (Brooklyn Coll.), Brooklyn, New York
Duttera, M. Julian, Jr. (Duke), West Point, Georgia
Edwards, Sam Bingham, Jr. (U. of N.C.), Sanford, North Carolina

^{*}Leave of absence.

Eisenberg, Carl Spencer (Ohio State U.), Euclid, Ohio Ellwanger, Frederick Robert, III (Duke), Pittsburgh, Pennsylvania Elmore, William Glenn (Texas Technological Coll.), Dallas, North Carolina Elsas, Frederick John (Harvard), Birmingham, Alabama Emslie, Robert Joseph (U. of Chicago), Elyria, Ohio Entman, Stephen Saul (Harvard Coll.), Jacksonville, Florida Fahy, Hugh Terrance (U. of Md.), Liverpool, New York Fee, William Homer, Jr. (Lafayette Coll.), Rockaway, New Jersey Flaherty, Lois Talbot (Wellesley), Staten Island, New York Foscue, Henry Armfield, Jr. (U. of N.C.), High Point, North Carolina Freeman, Douglas Garland, Jr. (U. of N.C.), Gates, North Carolina Freeman, Elsie Joan (Smith), Valley Stream, New York Freeman, Jonathan (Harvard), Palo Alto, California Goldenberg, Robert Lewis (Columbia), No. Miami Beach, Florida Goodner, David Marshall (Duke), Rio Piedras, Puerto Rico Green, Richard Lee (Swarthmore), Pittsburgh, Pennsylvania Haberkern, Robert Paul (Rutgers), Highland Park, New Jersey Hall, James Hardman (Princeton), Danville, Virginia Harrison, Frank Late, Jr. (Duke), South Charleston, West Virginia Hart, John Martin Hicks (U. of N.C.), Durham, North Carolina Henley, Thomas Franklin (U. of N.C.), Chapel Hill, North Carolina Henry, David Patterson, II (U. of N.C.), Chapel Hill, North Carolina Holberg, Doris Gayle (Rice), Houston, Texas Hopkins, Jay Everett (Duke), Durham, North Carolina Hutchinson, Forney, III (Harvard), Tulsa, Oklahoma Hyers, Thomas Morgan (Duke), Palatka, Florida Jackson, Gitta Wiessner (Lette-Haus), Berlin, Germany Johnson, Laurance Folkey (Carleton Coll.), Springfield, Illinois Jones, Dennis Eblen Darnell (U. of Tenn.), Knoxville, Tennessee Jones, Howard Wilbur, III (Amherst), Baltimore, Maryland Katz, David Harvey (Med. Coll. of Virginia), La Jolla, California Kern, Frank (U. of Pa.), Miami, Florida Kirkland, Rebecca Grey Trent (Duke), Durham, North Carolina Kunstling, Ted Richard (Duke), Laguna Beach, California Kwart, Arnold Martin (U. of Fla.), Miami, Florida Lebbin, Dennis Roy (U. of Chicago), Chicago, Illinois Levy, Bertram Joseph (Emory Univ.), Roosevelt, New York Logan, William Sumner (Davidson), Lakeland, Florida Mandetta, Donald Frank (Colgate), Glen Rock, New Jersey Miller, Richard Lawrence (Franklin & Marshall Coll.), Patchogue, New York Miller, Robert David (Davidson), Chapel Hill, North Carolina Moore, Terence Neal (The Citadel), Dundalk, Maryland Morton, Robert Edmund (U. of Rochester), Mamaroneck, New York Older, Robert Alan (Wesleyan), Teaneck, New Jersey Park, William Isaiah, III (Dartmouth), Springfield, Missouri Parker, Michael Dean (Fla. State U.), Madison, Indiana Plonk, James Wendell (Duke), Kings Mountain, North Carolina Porter, Roger John (Fla. Presb. Coll.), St. Petersburg, Florida Reisman, Terence Nat (Duke), Miami, Florida Sarver, Edward John (Northwestern), Fort Wayne, Indiana Seligson, David (Harvard), Brookline, Massachusetts Seningen, Ronald Perry (Duke), Newark, Delaware Sherwood, Geoffrey Kray (Brown), Middletown, Connecticut Silvers, David Nathan (Haverford), Roslyn Heights, New York

Simpson, Joe Leigh (Duke), McComb, Mississippi

Snider, Joel Joseph (Columbia), Brooklyn, New York Sollek, Mark G. (U. of Cincinnati), Cincinnati, Ohio Stasikowski, Jacek Jan (Med. Acad., Krakow, Poland), Lakewood, Ohio Stucky, Robert Christopher (Western Reserve U.), Glen Rock, New Jersey Taft, Charles Van (Duke), Greenville, North Carolina Taylor, Andrew Thompson, Jr. (Rice), Jackson, Tennessee Thurston, Thomas Gardiner, III (Davidson), Salisbury, North Carolina Utley, John Dement (Duke), Durham, North Carolina Wald, Harlan Ira (Duke), Scarsdale, New York Wheeler, William Felix, Jr. (U. of S.C.), Blackville, South Carolina Wilson, James Walter (Univ. of Ky.), Durham, North Carolina Wohlgemuth, Stephen Alan (Drew), Long Valley, New Jersey Wynne, Marigail (U. of Rochester), Scarsdale, New York

Class of 1967

Allen, David Geoffrey (Wesleyan), New York, New York Auburn, Robert Mark (Washington & Lee), Falls Church, Virginia Austin, Henry Vann (Davidson), Clinton, North Carolina Ayers, Leona Bell Weston (Duke), Garner, North Carolina Ballentine, Rudolph Miller, Jr. (Duke), Ballentine, South Carolina Bath, Nicholas Middleton (Emory), Tampa, Florida Beck, Robert Lee (Howard), San Diego, California Beshear, James Robert (U. of Ky.), Dawson Springs, Kentucky Blackburn, William W., II (Duke), Fort Meade, Maryland Boggess, Howard Preston (Yale), Fairmont, West Virginia Broadbent, David N. (U. of Ill.), Champaign, Illinois Brown, Gerald La Vonne (Johns Hopkins), Athens, Georgia Brown, Walter A. (Hamilton Coll.), Tuckahoe, New York Buehler, John Henze (Oberlin), North Haven, Connecticut Bunin, John Thomas (Rutgers), Kearny, New Jersey Butler, Stephen Allen (Davidson), Columbus, Georgia Campbell, Barry Blair (Johns Hopkins), Millville, New Jersey Chervin, Paul Niesen (U. of Vt.), Worcester, Massachusetts Clausen, Jack Lewis (Harvard Sch. of Med.), Los Angeles, California Crawford, Fred Allen, Jr. (Duke), Holly Hill, South Carolina Culver, Charles (Duke), Ringwood, New Jersey Danford, Jerry L. (Duke), Durham, North Carolina Dean, Arthur J., Jr. (U.S. Mil. Acad.), Laurinburg, North Carolina DeHart, Henry Sykes (V.P.I.), Blacksburg, Virginia Delse, Frederick Charles (M.I.T.), Cleveland, Ohio. Dodson, William Edwin (Duke), Durham, North Carolina Farber, Mark (Columbia Coll.), Brooklyn, New York Flaherty, John T. (M.I.T.), Delmar, New York Futrell, J. William (Duke), Lynchburg, Virginia Gaines, Robert W. (U. of Cincinnati), New York, New York Gallis, Harry Anthony (Princeton), Athens, Georgia Gerber Carl Joseph (Washington U.), Durham, North Carolina Gianaras, George Mike (Duke), Tarpon Springs, Florida Giordano, Vincent B. (U. of Rochester), Endicott, New York Grode, David Lloyd (Duke), Hewlett, Long Island, New York Harper, Eugene Jutson (Duke), Knightdale, North Carolina Head, Rufus Womack (Univ. of Texas Southwestern Med. Sch.), Sherman, Texas

Holdt, Janice E. Jones (Wilson Coll.), Dover, New Jersey Hollister, David William (Oberlin), Bethesda, Maryland Huddleston, John F. (U. of Fla.), Jacksonville, Florida Hudson, Terry Mack (Duke), Charleston, West Virginia Jurgelsky, William (Rutgers), Kensington, Maryland Kendall, Malcolm Eugene (Duke), Front Royal, Virginia Kesler, Richard William (Johns Hopkins), Munster, Indiana Kurtz, Robert Melvyn (Cornell), Rockville Centre, New York Levine, Michael Stuart (U. of Pa.), Macon, Georgia Lynch, Charles T., Jr. (Duke), Beaufort, North Carolina Maniscalco, Benedict S. (U. of Fla.), Tampa, Florida Marshall, Robert N. (Davidson), Clemmons, North Carolina Matthews, Minor E. (Yale), Huntington, West Virginia McLees, Byron D. (Johns Hopkins), Little Rock, Arkansas McMillan, Michael Reid (The Citadel), Conway, South Carolina Meriwether, Wilhelm D. (Mich. State), Charleston, South Carolina Miller, Robert F. (Haverford), Tallahassee, Florida Modirzadeh, Jamal (Duke), Tehran, Iran Otchin, Neil Stuart (U. of Fla.), Miami Beach, Florida *Peery, Charles V., II (Davidson), Kinston, North Carolina Raynor, A. Clark (Wake Forest), Ormond Beach, Florida Riddick, Daniel Howison (Duke), Lynchburg, Virginia Robinson, Stephen C. (Emory), Griffin, Georgia Rosati, Robert A. (Yale), Durham, North Carolina Saltz, James E., Jr. (Duke), St. Petersburg, Florida Samuels, Jesse David (Columbia), Flushing, New York Saunders, Wade H., III (Hampden-Sydney Coll.), Roanoke, Virginia Scarborough, W. A., Jr. (Duke), Wendell, North Carolina Scherer, James L. (Kenyon), Niles, Ohio Schneider, Henry C., Jr. (Williams), Meadowbrook, Pennsylvania Segal, Herbert Erwin (Rutgers), Newark, New Jersey Smith, Sandra Mildred (U. of Miss.), Texarkana, Arkansas Speropoulos, Athan John (Johns Hopkins), Miami, Florida Stowell, R. Jeremy Averill (Northwestern), Broken Arrow, Oklahoma Stubbs, Allston J., Jr. (Duke), Durham, North Carolina Sugioka, Mary Hinternhoff (Duke), Leaksville, North Carolina Thrash, Melvin Lawrence (Duke), Biltmore, North Carolina Trout, Hugh Henry, III (Washington & Lee), Roanoke, Virginia Twele, Thomas (Columbia Coll.), Syosset, New York Underwood, Lee C., III (Oberlin), Canton, Ohio Vollmer, Robin T. (Duke), Louisville, Kentucky Wetterau, Norman W. (Wheaton), Akron, Ohio Wilfong, Robert F. (U. of N.C.), Carrboro, North Carolina Williams, Donald Jarvis (Univ. of Hawaii), Kennewick, Washington Willson, Leroy M., Jr. (U. of N.C.), Oxford, Georgia Willwerth, Ben Matthews (Duke), Montour Falls, New York Witherspoon, John Michael (Duke), Brookeville, Maryland Woodard, William T., Jr. (Duke), Coral Gables, Florida

Class of 1966 with Internship Appointments

Adler, Charles Spencer (Whitestone, N.Y.), Tucson Med. Education Program, Tucson, Arizona

^{*}Leave of absence.

Alexander, Ann Wellington (Durham, N.C.), Duke Hosp., Durham, North Carolina Alexander, James Allen (Gastonia, N.C.), Duke Hosp., Durham, North Carolina Allen, Barna Titus, Jr. (Leaksville, N.C.), Univ. of Florida Teaching Hosp., Gainesville, Florida

Allen, James Kenneth (Florence, S.C.), Med. Coll. of Virginia, Richmond, Virginia Appen, Richard Everett (Nashville, Tenn.), Duke Hosp., Durham, North Carolina Bechtel, Richard C., Jr. (Doylestown, Pa.), Blodgett Mem. Hosp., Grand Rapids, Michigan

Berry, Peter Evans (Atlanta, Ga.), Grady Mem. Hosp., Atlanta, Georgia
Bland, Wiley Ray (Edward, N.C.), Duke Hosp., Durham, North Carolina
Borden, Ernest Carleton (Fayetteville, Ark.), Duke Hosp., Durham, North Carolina
Bradford, John Wilson (Charleston, W. Va.), Duke Hosp., Durham, North Carolina
Brian, Earl Winfrey, Jr. (Raleigh, N.C.), Palo Alto Stanford Ctr., Palo Alto,
California

Brown, Robert Glenn (Norfolk, Va.), Univ. of Fla. Teaching Hosp., Gainesville, Florida

Burk, Peter Gordon (Bloomington, Minn.), Health Ctr. Hosps., Pittsburgh, Pennsylvania

Carr, William Alexander (Charlotte, N.C.), Grady Mem. Hosp., Atlanta, Georgia Clark, Joe Lynn (Durham, N.C.), Duke Hosp., Durham, North Carolina

Cooper, Edwin Branan, Jr. (Arlington, Va.), Univ. of Virginia, Charlottesville, Virginia

Crook, John Newman (Opelika, Ala.), Charity Hosp. of Louisiana, New Orleans, Louisiana

Currie, Donald Patrick (Durham, N.C.), Duke Hosp., Durham, North Carolina Davis, Walter Etchells (Durham, N.C.), Duke Hosp., Durham, North Carolina Dick, William Barton (Morristown, Tenn.), Univ. of Kentucky Hosps., Lexington, Kentucky

Dillingham, William Stephen (Lancaster, S.C.), Michael Reese Hosp., Chicago, Illinois

Donovan, Lawrence T. (Chapel Hill, N.C.), St. Joseph's Infirmary, Atlanta, Georgia Ferris, Barry (Mt. Carmel, Haifa, Isr.), Michael Reese Hosp., Chicago, Illinois Fisher, Robert Burton (Patchogue, L.I., N.Y.), Queen's Hosp., Honolulu, Hawaii Ford, Raymond Foust (Chatham, N.J.), Duke Hosp., Durham, North Carolina Fox, William Willis (Ruxton, Md.), Health Ctr. Hosps., Pittsburgh, Pennsylvania Gaede, Jane Taylor (Winston-Salem, N.C.), North Carolina Baptist Hosp., Winston-Salem, North Carolina

Graham, Doyle Gene (Durham, N.C.), Duke Hosp., Durham, North Carolina Grant, John Andrew, Jr. (Tallahassee, Fla.), The New York Hosp., New York City, New York

Greene, John Elbert (Tallahassee, Fla.), Med. Coll. of Virginia, Richmond, Virginia

Grehl, Todd Michael (Fort Lauderdale, Fla.), Palo Alto Stanford Ctr., Palo Alto, California

Halikas, James Anastasio (Brooklyn, N.Y.), Barnes Hosp., St. Louis, Missouri
Hammett, Elliott Brian (Spartanburg, S.C.), Duke Hosp., Durham, North Carolina
Hayter, George Morris (Long Beach, Calif.), Queen's Hosp., Honolulu, Hawaii
Herron, Charles Burkhead (McKenzie, Tenn.), Duke Hosp., Durham, North Carolina
Hitch, David Charles (Raleigh, N.C.), Univ. of Virginia, Charlottesville, Virginia
Hopkins, Christie Benet (Columbia, S.C.), Duke Hosp., Durham, North Carolina
Johnson, James Ronald (Tulsa, Okla.), Los Angeles Co. Gen. Hosp., Unit I, Los
Angeles, California

Katz, Sheila Susan M. (New Haven, Conn.), Yale-New Haven Md. Ctr., New Haven, Connecticut

- Kline, George Litton (Robbins, Tenn.), Duke Hosp., Durham, North Carolina Kohler, Stewart Edwin (Blacksburg, Va.), Duke Hosp., Durham, North Carolina Lewis, Alvin Marinous (Durham, N.C.), Duke Hosp., Durham, North Carolina Lohrbauer, Leif Anthony (Largo, Fla.), Duke Hosp., Durham, North Carolina Martin, Mitz McDowell(Halifax, Va.), Univ. of Virginia Hosp., Charlottesville, Virginia
- McCully, James Greig (Jacksonville, Fla.), Grady Mem. Hosp., Atlanta, Georgia McGregor, Douglas Hugh (Pelham, N.Y.), Univ. of California Hosp., Los Angeles, California
- Mignone, Robert Joseph (North Haven, Conn.), Yale-New Haven Med. Ctr., New Haven, Connecticut
- Moorman, Claude T., II (Miami, Fla.), Duke Hosp., Durham, North Carolina Morriss, Frank Howard, Jr. (Birmingham, Ala.), Duke Hosp., Durham, North Carolina
- Nash, James Loren (Durham, N.C.), Duke Hosp., Durham, North Carolina Newmark, Emanuel (Newark, N.J.), George Washington Univ. Hosp., Washington, D. C.
- Niemeyer, Charles John (Durham, N.C.), Duke Hosp., Durham, North Carolina Norton, Charles Bryan, Jr. (Jacksonville, Fla.), Duke Hosp., Durham, North Carolina
- Nuckolls, James Garland (Galax, Va.), Duke Hosp., Durham, North Carolina Obenour, Linda Clark (Knoxville, Tenn.), Duke Hosp., Durham, North Carolina Obenour, William Hypes, Jr. (Knoxville, Tenn.), Duke Hosp., Durham, North
- Carolina
 Osteen, Robert Tilden (Savannah, Ga.), Duke Hosp., Durham, North Carolina
 Polynor, Forl Alfred (Weshington C.H., O.), Univ. of Coloreda Med. Ctr., Deputer
- Palmer, Earl Alfred (Washington C.H., O.), Univ. of Colorado Med. Ctr., Denver, Colorado
- Perriello, Vito Anthony, Jr. (Dunbar, W. Va.), Duke Hosp., Durham, North Carolina Pierson, Willard Cresse, Jr. (Raleigh, N.C.), Emory Univ., V.A. Hosp., Atlanta, Georgia
- Price, William David (Champaign, Ill.), Rochester Gen. Hosp., Rochester, New York
- Ray Karl Arthur (Greensboro, N.C.), Duke Hosp., Durham, North Carolina Redding, Marshall Simms (Greensboro, N.C.), Portsmouth Naval Hosp., Portsmouth, Virginia
- Rich, John Murray (Covington, Ky.), University Hosps., Columbus, Ohio Robertson, James Davis (Weirton, W. Va.), Univ. of California at Los Angeles, Ctr. for the Health Sciences, Los Angeles, California
- Rozear, Marvin Price (Jacksonville, Fla.), Duke Hosp., Durham, North Carolina Scott, George Stuart (Augusta, Ga.), Duke Hosp., Durham, North Carolina
- Shock, John Paul, Jr. (Webster Springs, W. Va.), Walter Reed Army Hosp., Washington, D. C.
- Smith, Craig Thomas (Bala Cynwyd, Pa.), George F. Geisinger Hosp., Danville, Pennsylvania
- Smith, David Helmar (Hyattsville, Md.), Med. Coll. of Virginia, Richmond, Virginia
- Smith, David Lambuth (Coffeeville, Miss.), Duke Hosp., Durham, North Carolina Smith, Roberta McNeill (Columbia, S.C.), Med. Coll. of Virginia, Richmond, Virginia
- Snead, Joseph Akin (Anderson, S.C.), Charity Hosp., Tulane Div., New Orleans, Louisiana
- Stewart, John Jamieson, Jr. (Staten Island, N.Y.), Univ. of Florida Teaching Hosp., Gainesville, Florida

Threlkel, Robert Hays (Owensboro, Ky.), Vanderbilt Univ. Affiliated Hosp., Nashville, Tennessee

Valicenti, James Francis (Hallandale, Fla.), Rhode Island Hosp., Providence, Rhode Island

Wasserman, Louis Leslie, Jr. (Norfolk, Va.), Norfolk Gen. Hosp., Norfolk, Virginia Weber, Jaroy, Jr. (Beaumont, Tex.), Palo Alto Stanford Ctr., Palo Alto, California Zirkle, Lewis Greer, Jr. (Warwick, R.I.), Duke Hosp., Durham, North Carolina



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BULLETIN OF DUKE UNIVERSITY

Directory of the Officers, Faculty, and Staff 1967





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Durham, North Carolina 1967



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† Deceased 2-27-67

Deceased 9-23-66

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Francis Xavier Schumacher, B.S.

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Frederick Adolphus Wolf, Ph.D.

James B. Duke Professor Emeritus of Botany 924 Urban Avenue

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Donald Keith Adams (1931), Ph.D. (Yale)

Professor of Psychology 1214 West Cornwallis Road

P. Wesley Aitkin (1964), Th.M. (Duke) Assistant Professor of Pastoral Care

2909 Harriman Drive

John Richard Alden (1955), Ph.D. (Michigan) James B. Duke Professor of History

2736 Dogwood Road Irving E. Alexander (1963), Ph.D. (Princeton)

Professor of Psychology and Professor of Medical

Psychology in Department of Psychiatry 1111 Watts Street

John Cooley Altrocchi (1957), Ph.D. (California)

Associate Professor of Psychology and Associate Professor of Medical Psychology in Department of Psychiatry 1110 Woodburn Road

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Professor of Urology	Marian) 3102 Devon Road
Marcelino Amaya (1966), M.D. (Nacional Automona de Associate in Psychiatry 501 Ce	entral Avenue, Butner, N. C
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Professor of Immunology and	Route 3
Associate Professor of Experimental Surgery	Hillsborough, N. C
Nicholas Anastasiow (1966), Ph.D. (Stanford)	
Adjunct Associate Professor of Education	2948 Friendship Road
Carl L. Anderson (1955), Ph.D. (Pennsylvania)	- '
Associate Professor of English	Route 2, Box 366
Edward E. Anderson (1966), M.D. (Duke)	
Assistant Professor of Urology	1 Winthrop Cour
Lewis Edward Anderson (1936), Ph.D. (Pennsylvania)	
Professor of Botany	2020 Sunset Avenue
Nels Anderson (1966), Ph.D. (Purdue)	
Associate in Physiology and Pharmacology and	Route
Associate in Obstetries and Gynceology	Hillsborough, N. C
Roger F. Anderson (1950), Ph.D. (Minnesota)	P P
Professor of Forest Entomology	2528 Perkins Road
William B. Anderson (1965), M.D. (Minnesota)	are Out at Drive
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Assistant Professor of Linguistics in Department of S	
Languages and Literatures and Assistant Professor of	
in Department of Sociology and Anthropology	1017 Norwood Avenue
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Kiro Pete Arges (1953), M.S. in C.E. (Tennessee)	1402 Woodbuill Road
Assistant Professor of Civil Engineering	802 West Maynard Street
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Assistant Professor of Physiology and	
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Erika Rosi Eva Arndt (1964), B.A. (Berlin)	
Instructor in German	920 Urban Avenue
Alois Arnoldner (1966), Ph.D. (Vienna)	
Visiting Lecturer in German	1006 Demerius Street
John Leslie Artley (1955), D.Eng. (Johns Hopkins)	
Professor of Electrical Engineering	2417 Wrightwood Avenue
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Associate in Pathology and Medical Technology	1200 Leon Street
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Edward H. Bryan (1960), Ph.D. (Wisconsin) Professor of Civil Engineering

2743 Sevier Street

Paul Robey Bryan, Jr. (1951), Ph.D. (Michigan) 1108 Watts Street Associate Professor of Music Virginia S. Bryan (1965), Ph.D. (Duke) Assistant Professor of Botany 1108 Watts Street Edwin Constant Bryson (1931), LL.B. (Oregon) Professor of Law and Professor of Legal Medicine 818 Anderson Street Marion Bryson (1962), Ph.D. (Iowa State) Assistant Professor of Mathematics and Assistant Professor of Preventive Medicine 2900 Arnold Street Victor Albert Bubas (1959), B.S. (North Carolina State) Instructor in Physical Education 4040 Nottaway Road C. Edward Buckley (1963), M.D. (Duke) Assistant Professor of Medicine and Associate in Immunology in the Department of Microbiology 3621 Westover Road Louis J. Budd (1952), Ph.D. (Wisconsin) Professor of English 2753 McDowell Street Albert George Buehler (1955), M.A. (North Carolina) Assistant Professor of Physical Education 4713 Stafford Drive John Buettner-Janusch (1965), Ph.D. (Michigan) Associate Professor of Anatomy and 804 Berkeley Street Associate Professor of Zoology Mary Jane Mordan Burch (1961), M.Ed., M.S.N. (Yale) Route 2 Chapel Hill, N. C. Associate Professor of Nursing Donald Smiley Burdick (1962), Ph.D. (Princeton) 108 Emerald Circle Assistant Professor of Mathematics Robert M. Burger (1962), Ph.D. (Brown) Adjunct Associate Professor of Electrical Engineering 1506 Rosedale Avenue Peter M. Burkholder (1965), M.D. (Cornell) Assistant Professor of Pathology 2815 Welcome Drive Jacob Burlak (1965), Ph.D. (Cantab.) Associate Professor of Mathematics 1411 Anderson Street Richard O. Burns (1964), Ph.D. (Illinois) Assistant Professor of Microbiology Route 3, Kelly Drive Apartment B-3 Cornelius Bushover, III (1966), M.A. (Duke) Instructor in Political Science 812 Green Street Ewald W. Busse (1953), M.D. (Washington) J. P. Gibbons Professor of Psychiatry 1132 Woodburn Road John C. Butner (1965), B.S. (Naval Academy) Associate Professor of Naval Science 2309 Prince Street Gale Herbert Buzzard (1956), Ph.D. (North Carolina State) Assistant Professor of Mechanical Engineering 4813 Brentwood Road J. Scott Byrd (1965), M.A. (North Carolina) 407-B East Franklin Street Instructor in English Chapel Hill, N. C. William Lawrence Byrne (1954), Ph.D. (Wisconsin) Associate Professor of Biochemistry 2531 Sevier Street John B. Cahoon, Jr. (1958), A.S.X.T., R.T. (Duke) Assistant Professor of Radiologic Technology 2418 Perkins Road Sam Johnston Caldwell (1964), B.S. (U.S.N.A.) Captain, U.S.N. Professor of Naval Science 2816 Devon Road Jasper Lamar Callaway (1937), M.D. (Duke) James B. Duke Professor of Dermatology 828 Anderson Street Edmund McCullough Cameron (1926), A.B. (Washington & Lee) Director of Physical Education and Athletics 2818 Chelsea Circle

Janet E. Campbell (1962), M.A. (Chicago) East Lake Ann Drive Assistant Professor of Nursing Raleigh, N. C. Ramon V. Canent (1965), M.D. (Santo Tomas, Manila) Associate in Pediatrics 4022 Neal Road M. Paul Capp (1962), M.D. (North Carolina) Associate Professor of Radiology 804 Starmount Drive Peter Carbone (1966), Ed.M. (Harvard) Assistant Professor of Education 111 Benrose Circle Leonard Carlitz (1932), Ph.D. (Pennsylvania State) James B. Duke Professor of Mathematics 2303 Cranford Road David Williams Carpenter (1929), Ph.D. (Duke) Professor of Physics 137 Pinecrest Road Dwight W. Carpenter (1966), Ph.D. (Illinois) Assistant Professor of Physics 1015 Green Street Robert C. Carson (1960), Ph.D. (Northwestern) Associate Professor of Medical Psychology in Department of Psychiatry and Associate Professor of Psychology 3030 Glendale Avenue Francis Bayard Carter (1931), M.D. (Johns Hopkins) Professor of Obstetrics and Gynecology 5 Sylvan Road William H. Cartwright (1951), Ph.D. (Minnesota) Professor of Education 2114 Campus Drive G. S. Terrence Cavanagh (1962), B.L.S. (McGill) Apartment F-8 Professor of Medical Literature 1200 Leon Street Patrick J. Cavanaugh (1960), Diplomat in Radiation Therapy, M.D. (St. Louis) Associate Professor of Radiology Apartment 6, 618 Morehead Avenue John W. Cell (1962), Ph.D.(Duke) Assistant Professor of History 2101 Dartmouth Drive Jack B. Chaddock (1966), Sc.D. (Massachusetts Institute of Technology) Professor of Mechanical Engineering 2535 Sevier Street Leon E. Chaiken (1952), M.F. (Cornell) Professor of Forest Management 2737 Dogwood Road Arthur C. Chandler (1965), M.D. (Duke) Assistant Professor of Ophthalmology 2408 Alpine Road James T. Chen (1965), M.D. (National Defense Medical Center, Taipei, Taiwan) Associate in Radiology 9C Channing Court Apartments Ronald W. Chen (1962), Ph.D. (California) Assistant Professor of Experimental Surgery 1011 Anderson Street Walter Boris Cherny (1957), M.D. (McGill) Associate Professor of Obstetrics and Gynecology 2 Kimberly Drive Clifton C. Cherpack (1958), Ph.D. (Johns Hopkins) Professor of Romance Languages 235 Forestwood Drive Donald B. Chesnut (1965), Ph.D. (California Institute of Technology) Associate Professor of Chemistry 4404 Malvern Road Arthur Christakos (1963), M.D. (South Carolina) Assistant Professor of Obstetrics and Gynecology 2904 Winton Road C. Donald Christian (1964), M.D., Ph.D. (Duke) Associate Professor of Obstetrics and Gynecology and Assistant Professor of Anatomy 1023 Sycamore Street Giorgio Ciompi (1964), Master (Paris Conservatory) Visiting Artist in Music 33 Kimberly Drive James R. Clapp (1963), M.D. (North Carolina) Assistant Professor of Medicine King Charles Road Elon Henry Clark (1934) Professor of Medical Art and Illustration 801 West Maynard Avenue

Henry B. Clark (1966), Ph.D. (Yale) Associate Professor of Religion Kenneth Willis Clark (1931), B.D., Ph.D. (Chicago) Professor of New Testament Lelia Ross Clark (1949), M.A. (Columbia) Professor of Nursing Service Romane Lewis Clark (1953), Ph.D. (Iowa) Professor of Philosophy Robert B. Claytor (1964), Th.M. (Duke) Instructor in Pastoral Care James T. Cleland (1945), Th.D. (Union) James B. Duke Professor of Preaching Edward Clifford (1965), Ph.D. (Minnesota) Assistant Professor of Medical Psychology Frank W. Clippinger (1957), M.D. (Washington) Associate Professor of Orthopedic Surgery John L. E. Clubbe (1966), Ph.D. (Columbia) Assistant Professor of English John M. Clum (1966), M.A. (Princeton) Assistant Professor of English Sanford I. Cohen (1957), M.D. (Chicago) Professor of Psychiatry Robert Taylor Cole (1935), Ph.D. (Harvard) James B. Duke Professor of Political Science Joel G. Colton (1947), Ph.D. (Columbia) Professor of History Robert Merle Colver (1953), Ed.D. (Kansas) Associate Professor of Education Norman Francis Conant (1935), Ph.D. (Harvard) James B. Duke Professor of Microbiology Aostolos Condos (1966), Ph.D. (Iowa State) Assistant Professor of Economics Robert L. Cook (1965) Instructor in Physics Samuel D. Cook (1966), Ph.D. (Ohio State) Visiting Associate Professor of Political Science Hallie M. Coppedge (1966), A.B. (Meredith) Associate in Psychiatric Social Work Thomas Howard Cordle (1950), Ph.D. (Yale) Associate Professor of Romance Languages Bruce A. Corrie (1965), M.S. (Indiana) Assistant Professor of Physical Education John D. Costlow (1959), Ph.D. (Duke) Associate Professor of Zoology R. Merritt Cox (1966), M.A. (Wiseonsin) Instructor in Romance Languages Robert Calvin Cox (1942), M.A. (Columbia) Associate Professor of Physical Education Janet Baker Craig (1965), M.S.N. (Duke) Instructor in Nursing Joyce Crane (1964), M.S.N. (Western Reserve) Assistant Professor of Nursing Robert Irwin Crane (1961), Ph.D. (Yale) Professor of History

1646 Marion Avenue 2117 Campus Drive 920 Monmouth Avenue 1302 Oakland Avenue 209 Watts Street Apartment N-3B 1500 Duke University Road 1334 Welcome Circle 7 Sylvan Road 2801 Dogwood Road 2720 Circle Drive Route 3, Box 62 Garrett Road Apartment 19 100 North Duke Street Carwin Apartments #6 Apartment 14 Town House Apartments 3435 Cromwell Road 916 West Markham Avenue 2213 Carver Street 201 Ann Street Beaufort, N. C. Apartment 5A 1803 House Avenue 1913 University Road 405 Leon Street 2717 Augusta Drive 2733 Sevier Street

1308 West Markham Avenue

1506 Woodland Drive

2511 Sevier Street

*Robert Nowell Creadick (1946), M.D. (Yale) Professor of Obstetrics and Gynecology 1200 Anderson Street Marion Caryle Crenshaw, Jr. (1964), M.D. (Duke) Assistant Professor of Obstetrics and Gunecologu and Associate in Physiology Route 2, Roxboro Road J. Christopher Crocker (1966), B.A. (Duke) Erwin Road Visiting Assistant Professor of Anthropology Route 1, Box 215 Elaine Kobrin Crovitz (1965), Ph.D. (Duke) Associate in Medical Psychiatry 3415 Hope Valley Road Herbert Crovitz (1963), Ph.D. (Duke) Assistant Professor of Medical Psychology in Department of Psychiatry and Lecturer in Psychology 3415 Hope Valley Road William L. Culberson (1955), Ph.D. (Wisconsin) Associate Professor of Botany King Road, Route 1 Charles Culver (1963), Ph.D. (Duke) Assistant Professor of Nursing Education 2920 Guess Road John Shelton Curtiss (1945), Ph.D. (Columbia) James B. Duke Professor of History 4418 Guess Road Robert Earl Cushman (1945), B.D., Ph.D. (Yale) Professor of Systematic Theology 2022 Campus Drive W. Kenneth Cuyler (1959), Ph.D. (Duke) Professor of Obstetrics and Gynecology and Associate Professor of Cytology and Anatomy Route 1, Box 52 Bingham Dai (1943), Ph.D. (Chicago) Professor of Psychology and Professor of Mental Hygiene 2404 Perkins Road Charles J. Daly (1963), M.Ed. (Pennsylvania) Instructor in Physical Education 2307 Anthony Drive Boyd Lee Daniels (1952), B.D., Ph.D. (Duke) Assistant Professor of Religion 220 Dacian Avenue Ollie Belle Davenport (1961), M.S.N. (Western Reserve) Assistant Professor of Nursing 905 West Knox Street Eugene A. Davidson (1957), Ph.D. (Columbia) Professor of Biochemistry 1639 Marion Avenue David George Davies (1961), Ph.D. (California) Professor of Economics 2631 McDowell Street William David Davies (1966), D.D. (Wales) George Washington Ivey Professor of Advanced 606 West 122nd Street New York, N. Y. Studies in New Testament and Christian Origins Calvin D. Davis (1962), Ph.D. (Indiana) Associate Professor of History Apartment 25, Alastair Court Gifford Davis (1930), Ph.D. (Harvard) Professor of Romance Languages 2248 Cranford Road Morris Davis (1966), Ph.D. (Yale) 404 Estes Drive Adjunct Professor of Mathematics Chapel Hill, N. C. Otho L. Davis (1965), M.A. (Kent State) Assistant Professor of Physical Education 214 Landsbury Street Eugene Davis Day (1962), Ph.D. (Delaware) Professor of Immunology 2727 McDowell Street Louis DeAlessi (1961), Ph.D. (California) Associate Professor of Economics 2624 McDowell Street John Essary Dees (1939), M.D. (Virginia) Professor of Urology 413 Carolina Circle

° Deceased 3-2-66

Mrs. Susan Coons Dees (1939), M.D. (Johns Hopkins) 413 Carolina Circle Professor of Pediatries Robert F. Degnon (1965), B.A. (North Carolina) Assistant Professor of Naval Science 2504 Nation Avenue William J. DeMaria (1951), M.D. (Duke) Professor of Preventive Medicine and 1126 Woodburn Road Associate Professor of Pediatrics Sara Jamison Dent (1955), M.D. (South Carolina) Route 1, Box 21A Professor of Anesthesiology Hillsborough, N. C. Frank Traver de Vyver (1935), Ph.D. (Princeton) Professor of Economics 8 Sylvan Road Irving Diamond (1958), Ph.D. (Chicago) Professor of Psychology 2745 McDowell Street Luca Di Cecco (1966), M.M. (Indiana) 221 Cornwallis Road Assistant Professor of Music D. A. T. Dick (1966) Visiting Professor of Physiology 631 Green Street Macdonald Dick (1932), M.D. (Johns Hopkins) Assistant Professor of Physiology and Pharmacology and Associate in Medicine 3005 Norwich Way Robert L. Dickens (1949), M.S. (North Carolina), C.P.A., LL.D. 2717 Circle Drive Professor of Accounting Marcus L. Dillon (1957), M.D. (Duke) Associate Professor of Surgery 1005 Minerva Avenue William O, Dobbins (1965), M.D. (Medical College of Alabama) Assistant Professor of Medicine Four Seasons Apartments Mrs. Marie-Therese Liniere Dow (1934), M.A. (Lyon) Assistant Professor of Romance Languages 2252 Cranford Road Neal Dow (1934), Ph.D. (Pennsylvania) Professor of Romance Languages 2252 Cranford Road Francis George Dressel (1929), Ph.D. (Duke) Professor of Mathematics 2502 Francis Street Bernard I. Duffey (1963), Ph.D. (Ohio State) Professor of English 2732 Dogwood Drive Kenneth Lindsay Duke (1940), Ph.D. (Duke) Associate Professor of Anatomy 2736 McDowell Street Mrs. Frances Yeager Dunham (1962), Ph.D. (Duke) 2137 Wright Avenue Assistant Professor of Nursing Education Greensboro, N. C. Robert F. Durden (1952), Ph.D. (Princeton) Professor of History 2532 Wrightwood Avenue Watt Weems Eagle (1930), M.D. (Johns Hopkins) Professor of Otolaryngology 804 Anderson Street Paul H. Earls (1959), Ph.D. (Rochester) Associate Professor of Music 1509 Hollywood Street Paul A. Ebert (1966), M.D. (Ohio State) Associate Professor of Surgery 4004 Bristol Road Ruth Buchanan Eddy (1952), M.S. (Smith) Associate Professor of Physical Education 702 Louise Circle James Michael Efird (1962), Ph.D. (Duke) Assistant Professor of Biblical Studies 2033 Parthenia Drive Carl Eisdorfer (1958), M.D., Ph.D. (New York) Associate Professor of Mcdical Psychology in Department 3423 Hope Valley Road of Psychiatry and Lecturer in Psychology

Robert Eisenberg (1965), Ph.D. (University College, London)

3503 Mossdale Avenue

Associate in Physiology

Jane G. Elchlepp (1956), M.D., Ph.D. (Chicago) Assistant Professor of Pathology Route 1, Cornwallis Road Norman Eliason (1966), Ph.D. (Johns Hopkins) Round Hill Road Visiting Professor of English Chapel Hill, N. C. Everett H. Ellinwood (1966), M.D. (North Carolina) Associate in Psychiatry 4716 Stafford Road William Whitfield Elliott (1925), Ph.D. (Cornell) Professor of Mathematics 1740 Hillandale Road Ernest Elsevier (1950), M.S.M.E. (Georgia Institute of Technology) Associate Professor of Mechanical Engineering 2412 Wrightwood Avenue Max D. Engelhart (1966), Ph.D. (Illinois) Lecturer in Education 2419 Perkins Road Norbert Beverley Enzer (1965), M.D. (McGill) Assistant Professor of Psychiatry and Associate in Pediatrics 2017 Dartmouth Drive Carl Erickson (1966), Ph.D. (Rutgers) Apartment 813 Assistant Professor of Psychology Poplar Apartments Robert P. Erickson (1961), Ph.D. (Brown) Associate Professor of Psychology 2601 Tanglewood Drive Charles W. Erwin (1966), M.D. (Texas) Associate in Psychiatry E. Harvey Estes, Jr. (1953), M.D. (Emory) Professor of Medicine 3542 Hamstead Court Lawrence E. Evans (1963), Ph.D. (Johns Hopkins) Assistant Professor of Physics 403 Watts Street John Wendell Everett (1932), Ph.D. (Yale) Professor of Anatomy 1105 Woodburn Road Robinson Oscar Everett (1956), LL.B. (Harvard) Adjunct Professor of Law 1200 Leon Street Henry A. Fairbank (1962), Ph.D. (Yale) Professor of Physics 1515 Pinecrest Road Carmen M. Falcone (1946), M.A. (Ohio State) Professor of Physical Education 1402 Woodburn Road W. Reynolds Farley (1964), Ph.D. (Chicago) Assistant Professor of Sociology Westover Park Apartments B-11 Donn Michael Farris (1959), B.D., M.S. in L.S. (Columbia) Associate Professor of Theological Bibliography 921 Buchanan Boulevard Ben W. Feather (1963), M.D. (George Washington) Box 3403 Assistant Professor of Psychiatry and Lecturer in Psychology Duke Hospital John Morton Fein (1950), Ph.D. (Harvard) Professor of Romance Languages 1911-C House Avenue Robert E. Fellows (1966), M.D. (McGill) Assistant Professor of Physiology and Assistant Professor of Medicine Arthur Bowles Ferguson (1939), Ph.D. (Cornell) Professor of History 22 Lebanon Circle Charles E. Ferguson (1957), Ph.D. (North Carolina) 1406 Kent Street Professor of Economics Oliver W. Ferguson (1957), Ph.D. (Illinois) Associate Professor of English 910 West Markham Avenue

Heriberto A. Ferrari (1966), M.D. (Buenos Aires) Assistant Professor of Anesthesiology 3734 Swathmore Road Bernard F. Fetter (1951), M.D. (Duke) 3826 Somerset Drive

Associate Professor of Pathology

Michael Finger (1965), B.A. (Texas) 1301 Hudson Street, Apartment H Assistant Professor of Economics Ronald L. Fishbaugh (1962), M.S. (Juilliard) Instructor in Music 1112 Buchanan Boulevard John Francis Flanagan (1961), M.D. (Duke) Assistant Professor of Medicine 2214 Elmwood Drive Walter L. Floyd (1959), M.D. (Johns Hopkins) Assistant Professor of Medicine 3356 Hamstead Court Donald J. Fluke (1958), Ph.D. (Yale) Professor of Zoology 2703 Sevier Street Diane G. Fogleman (1966), M.S. (North Carolina) Instructor in Nursing 4424 South Alston Avenue Lloyd R. Fortney (1964), Ph.D. (Wisconsin) Assistant Professor of Physics 1200 Leon Street Ellen Gwendolyn Fortune (1964), M.A. (Western Reserve) Associate Professor of Nursing 212 East Markham Avenue Marianka Fousek (1965), Ph.D. (Harvard) Assistant Professor of Religion 2722 Erwin Road Earle Cabell Fowler (1962), Ph.D. (Harvard) Lake Shore Drive Professor of Physics Chapel Hill, N. C. John Alvis Fowler (1953), M.D. (Bowman Gray) Professor of Psychiatry and Assistant Professor of Pediatrics 1514 Edgevale Road Wallace Fowlie (1964), Ph.D. (Harvard) 2007 House Avenue James B. Duke Professor of Romance Languages Apartment 19 Charles H. Frenzel (1956), B.A. (Duke) Professor of Hospital Administration 3950 Bristol Road Irwin Fridovich (1958), Ph.D. (Duke) Associate Professor of Biochemistry 3517 Courtland Drive Ruth Friedberg (1961), M.A. (North Carolina) Instructor in Music 2305 Elmwood Samuel J. Friedberg (1960), M.D. (Pennsylvania) Associate Professor of Medicine 2305 Elmwood John A. Friedrich (1963), Ph.D. (Michigan State) Professor of Physical Education 2953 Welcome Drive William J. Furbish (1954), M.S. (Wisconsin) Route 2 Associate Professor of Geology Hillsborough, N. C. Gerog-Heniz Gaertner (1966), (Institute West-Berlin) Visiting Lecturer in German 1011 Monmouth Avenue Mercedes Gaffron (1958), Ph.D., M.D. (Munich) Associate Research Professor of Psychology 1612 Maryland Avenue Nick Galifianakis (1960), LL.B. (Duke) Part-time Visiting Assistant Professor of Economics 2648 University Drive James J. Gallagher (1966), Ph.D. (Pennsylvania State) Adjunct Professor of Education and Psychology 2504 Wilson Street Thomas Muir Gallie, Jr. (1954), Ph.D. (Rice) Associate Professor of Mathematics and Associate Professor of Biomathematics 1012 West Trinity Avenue Clarence Ellsworth Gardner, Jr. (1930), M.D. (Johns Hopkins) P. O. Box 624 Professor of Surgery Hillsborough, N. C. Mrs. Ila H. Gehman (1959), Ed.D. (Pennsylvania State) Associate Professor of Medical Psychology in Department of Psychiatry and Lecturer in Psychology 2703 Spencer Street

W. Scott Gehman, Jr. (1954), Ph.D. (Pennsylvania State)
Associate Professor of Psychology in Education

2703 Spencer Street

Ernest A. E. Gellhorn (1966), LL.B. (Minnesota) Associate Professor of Law 2517 Wrightwood Avenue Rhett Truesdale George, Jr. (1957), Ph.D. (Florida) Assistant Professor of Electrical Engineering 3803 Tremont Drive Nicholas G. Georgiade (1951), D.D.S., M.D. (Duke) Professor of Plastic Maxillofacial and Oral Surgery 2523 Wrightwood Avenue Carl J. Gerber (1961), Ph.D. (Washington State) Associate in Physiology and Associate in Neurology 106 Lattimore Lane Gerald E. Gerber (1962), Ph.D. (Northwestern) Assistant Professor of English 2602 Francis Street *John Jay Gergen (1936), Ph.D. (Rice) Professor of Mathematics 2803 Nation Avenue Robert George Chirardelli (1962), Ph.D. (California Institute of Technology) Visiting Assistant Professor of Chemistry 1404 Anderson Street Daniel T. Gianturco (1966), M.D. (Buffalo) Associate in Psychiatry 4833 Stafford Drive Robert H. Gibbs (1964), M.D. (Duke) Assistant Professor of Medicine 2413 Pickett Road Donald Gillin (1959), Ph.D. (Stanford) Associate Professor of History 1300 Georgia Avenue James P. Gills (1965), M.D. (Duke) Assistant Professor of Ophthalmology 2528 Wrightwood Avenue Donald E. Ginter (1963), Ph.D. (California) Assistant Professor of History 1918 Dartmouth Drive Sherwood Githens, Jr. (1962), Ph.D. (North Carolina) Professor of Education 4427 Chapel Hill Road James F. Glenn (1963), M.D. (Duke) Professor of Urology 27 Oak Drive Clarence Gohdes (1930), Ph.D. (Columbia) James B. Duke Professor of English 2737 Circle Drive Joseph Leonard Goldner (1950), M.D. (Nebraska) Professor of Orthopedic Surgery 602 East Forest Hills Boulevard Richard A. Goodling (1959), B.D., Ph.D. (Pennsylvania State) Associate Professor of Pastoral Care Box 115-A, Route 1, Farrington Road Jack K. Goodrich (1965), M.D. (Tennessee) 612 Morgan Creek Road Associate Professor of Radiology Chapel Hill, N. C. Craufurd D. Goodwin (1962), Ph.D. (Duke) Associate Professor of Economics 2256 Cranford Road Walter Gordy (1946), Ph.D. (North Carolina), LL.D. James B. Duke Professor of Physics 2521 Perkins Road John A. Goree (1959), M.D. (Duke) Associate Professor of Radiology 3817 Hillgrand Circle Ralph J. Gorten (1963), M.D. (Pennsylvania) Assistant Professor of Medicine and Assistant Professor of Radiology 2436 Tryon Road Virginia Gover (1960), M.S.N. (Boston College) Assistant Professor of Nursing 2722 Brown Avenue Lindsay A. Graham (1965), M.D. (McGill) Assistant Professor of Psychiatry 1911-A House Avenue Richard Babson Grant (1952), Ph.D. (Harvard) Associate Professor of Romance Languages 2509 Wrightwood Avenue Irving Emery Gray (1930), Ph.D. (Wisconsin) Professor of Zoology 124 Pinecrest Road

* Deceased 1-16-67

Edward F. Grayson (1965), M.A. (George Washington) Assistant Professor of Naval Science 2510 Sparger Road Robert Lee Green, Jr. (1960), M.D. (Hahnemann) Associate Professor of Psychiatry 3700 Hermine Street Ronald C. Greene (1958), Ph.D. (California Institute of Technology) Assistant Professor of Biochemistry 1014 Norwood Avenue Joseph C. Greenfield (1962), M.D. (Emory) Associate Professor of Medicine 1212 Virginia Avenue John R. Gregg (1957), Ph.D. (Princeton) 3702 Randolph Road Professor of Zoology Robert A. Gregg (1961), M.D. (South Carolina) Associate Professor of Physical Medicine 2747 Sevier Street Eugene Greuling (1948), Ph.D. (Indiana) 2414 Perkins Road Professor of Physics Carlene M. Grim (1966), M.S.N. (North Carolina) 2121 West Pettigrew Street Instructor in Nursing Keith Sanford Grimson (1930-42; 1945), M.D. (Rush) Professor of Surgery 3313 Devon Road Egil Grislis (1959), B.D., Ph.D. (Yale) Associate Professor of Historical Theology 2323 Englewood Avenue Samson R. Gross (1960), Ph.D. (Columbia) Professor of Genetics and Biochemistry 2411 Prince Street Walter R. Guild (1960), Ph.D. (Yale) 2625 McDowell Street Professor of Biophysics J. Caulie Gunnells (1962), M.D. (South Carolina) Assistant Professor of Medicine 3317 Devon Road Norman Guttman (1951), Ph.D. (Indiana) 201 Woodridge Drive Professor of Psychology Robert A. Guyer (1964), Ph.D. (Cornell) Assistant Professor of Physics 3A Channing Court Apartments Donald B. Hackel (1960), M.D. (Harvard) Professor of Pathology 2535 Perkins Road Herbert Hacker, Jr. (1965), Ph.D. (Michigan) Assistant Professor of Electrical Engineering 108 Pinecrest Road Ellis P. Hagler (1936) Instructor in Physical Education 1715 Cornwallis Road Hugh Marshall Hall (1952), Ph.D. (Texas) Associate Professor of Political Science 2413 Wrightwood Avenue Iris H. Hall (1966), Ph.D. (North Carolina) Associate in Radiology 137 Emerald Circle Jack R. Hall (1965), M.A. (Georgia) Instructor in Physical Education 3329 Rolling Hill Road Kenneth D. Hall (1958), M.D. (Duke) Associate Professor of Anesthesiology 2715 Montgomery Street Louise Hall (1931), Ph.D. (Radcliffe) Professor of Architecture Box 6636, College Station Thor Hall (1962), B.D., Ph.D. (Duke) Assistant Professor of Preaching and Theology 3537 Hamstead Court John Hamilton Hallowell (1942), Ph.D. (Princeton) Professor of Political Science 3606 Darwin Road Iain Hamilton (1962), B.M. (London) Erwin Apartments Mary Duke Biddle Professor of Music Buchanan Boulevard William Baskerville Hamilton (1936), Ph.D. (Duke) 300 Swift Avenue Professor of History Alastair Court Apartments

Philip Handler (1939), Ph.D. (Illinois) James B. Duke Professor of Biochemistry and Nutrition 2529 Perkins Road Robert M. Hankin (1966), M.A. (Columbia) Assistant Professor of Russian 111 West Seeman Street John Kennedy Hanks (1954), M.A. (Columbia) Associate Professor of Music and Lecturer in Church Music 1810 Glendale Avenue Frank Allan Hanna (1948), Ph.D. (Wisconsin) Professor of Economics 2239 Cranford Road Barry Hannegan (1963), M.A. (New York) Visiting Instructor in Art 704 North Buchanan Boulevard Oscar Carl Edvard Hansen-Prüss (1930), M.D. (Johns Hopkins) Professor of Medicine 3303 Surrey Road Paul Hardin, III (1958), LL.B. (Duke) Professor of Law and Assistant Professor of Legal Medicine 2708 Sevier Street Charles M. Harman (1961), Ph.D. (Wisconsin) Associate Professor of Mechanical Engineering 2620 McDowell Street Ellwood Scott Harrar (1936), Ph.D. (Syracuse), Sc.D. James B. Duke Professor of Wood Science 2228 Cranford Road *Paul Harrawood (1956), M.S. in C.E. (Missouri) Assistant Professor of Civil Engineering 2516 Sevier Street Harold Joseph Harris (1960), M.D. (Long Island College of Medicine) Associate Professor of Psychiatry and 1009 Highland Woods Assistant Professor of Pediatrics Chapel Hill, N. C. Jerome Sylvan Harris (1936), M.D. (Harvard) J. Buren Sidbury Professor of Pediatrics and Associate Professor of Biochemistry 2907 Hope Valley Road Francis Parks Harrison (1947), Ph.D. (Michigan) Associate Professor of Physical Education 2722 Circle Drive James E. Hart (1966), A. B. (Harvard) Instructor in Political Science 500 Watts Street William John Harvey (1961), B.S. (Appalachian) Instructor in Physical Education N-3A University Apartments George Corbin Harwell (1935), Ph.D. (Duke) Associate Professor of English 2115 Wilson Street Charles Roy Hauser (1929), Ph.D. (Iowa) James B. Duke Professor of Chemistry 1020 Rosehill Avenue Clark C. Havighurst (1964), J.D. (Northwestern) Associate Professor of Law 307 Watts Street, Apartment D Charles P. Hayes (1964), M.D. (Duke) Assistant Professor of Medicine 3820 Hillgrand Circle

William S. Heckscher (1966), Ph.D. (Hamburg) P. O. Box 6605 College Station Benjamin N. Duke Professor of Art Peter L. Hein (1963), M.D. (Georgetown) RFD #1 221A Randolph Road Assistant Professor of Psychiatry

Ursula I. Heine (1965), Ph.D. (Humboldt) Associate in Experimental Surgery 1200 Leon Street, Apartment D-7 Martin Helling (1965), Ph.D. (Berkeley)

Assistant Professor of Mathematics 1007 Oakland Avenue Henry Hellmers (1965), Ph.D. (California)

1012 Norwood Avenue Professor of Botany James Paisley Hendrix (1938), M.D. (Pennsylvania) 144 Pinecrest Road Professor of Medicine and Therapeutics

* Through Fall Term 1966

Mrs. Mildred L. Hendrix (1958), B.S. (North Carolina) Assistant Professor of Music 144 Pinecrest Road Simeon K. Heninger (1955), Ph.D. (Johns Hopkins) Professor of English Yorke-Lancaster Houses James Donald Henry (1960), M.M. (Indiana) 311 West Delafield Street Instructor in Music Stuart C. Henry (1959), B.D., Ph.D. (Duke) Professor of American Christianity K-1-A University Apartments Stephen Duncan Heron, Jr. (1950), Ph.D. (North Carolina) Associate Professor of Geology Route 1, Box 267-1 Clyde F. Herreid, II (1965), Ph.D. (Pennsylvania State) Assistant Professor of Zoology 1420 Ruffin Street Brunildo Herrero (1966), M.D. (Florida) Associate in Medicine 1100 Oakland Avenue Javier Herrero (1966), Ph.D. (Madrid) Associate Professor of Romance Languages 1105 Urban Avenue Frederick L. Herzog (1960), Th.D. (Princeton) 2936 Chapel Hill Road Associate Professor of Systematic Theology Iulia G. Hester (1965), M.S. (North Carolina) Assistant Professor of Nursing Colonial Apartments Siegfried Heyden (1966), M.D. (Berlin) Associate Professor of Preventive Medicine 1407 Arnette Avenue Albert Heyman (1953), M.D. (Maryland) 1216 Woodburn Road Professor of Medicine Jacqueline Hijmans (1965), M.D. (State University, Leyden, Holland) 2907 Hope Valley Road Associate in Medicine David W. Hill (1962), Ph.D. (Stanford) Associate Professor of Engineering Mechanics in Apartment 8A Wood Circle Department of Civil Engineering Chapel Hill, N. C. Douglas Greenwood Hill (1931), Ph.D. (Princeton) Professor of Chemistry Box 275, Route 2, Pleasant Green Road Robert L. Hill (1961), Ph.D. (Kansas) Professor of Biochemistry 2510 Perkins Avenue Hans J. Hillerbrand (1959), Ph.D. (Erlangen) Associate Professor of Modern European Christianity 2729 Sevier Street Frederick R. Hine (1958), M.D. (Yale) Associate Professor of Psychiatry 2317 Prince Street Lowell A. Hinrichs (1962), Ph.D. (Oregon) Assistant Professor of Mathematics 47 Lebanon Circle Marcus Edwin Hobbs (1935), Ph.D. (Duke) Professor of Chemistry 115 Pinecrest Road Paul E. Hochstein (1963), Ph.D. (Maryland) Assistant Professor of Pharmacology 2027 Bivins Street Richard Earl Hodel (1965), Ph.D. (Duke) Assistant Professor of Mathematics 905 Exum Street C. S. Hodges (1963), Ph.D. (Georgia) 505 Pleasants Avenue Cary, N. C. Adjunct Associate Professor of Forest Pathology Charlotte Hogsett (1965), Ph.D. (Harvard) 708 Louise Circle Instructor in Romance Languages Mrs. Carol Clarke Hogue (1963), M.S.N. (Duke) Assistant Professor of Nursing 2913 Welcome Circle °Clyde Nelson Holland (1957), M.S. (Duke) Assistant Professor of Civil Engineering 612 North Gregson Street

° Through Fall Term 1966

Irving Brinton Holley, Jr. (1947), Ph.D. (Yale) Professor of History 2506 Wrightwood Avenue Frederic B. M. Hollyday (1956), Ph.D. (Duke) Associate Professor of History 1824 Forest Road Frances Virginia Lee Holton (1947), M.A. (Texas State) Associate Professor of Physical Education 407 Erwin Apartments Calvin Bryce Hoover (1925), Ph.D. (Wisconsin), Litt.D. James B. Duke Professor of Economics 1702 Duke University Road Everett Harold Hopkins (1961), A.M. (Pennsylvania), LL.D. Professor of Education 2016 Campus Drive Edward Charles Horn (1946), Ph.D. (Princeton), Sc.D. Professor of Zoology 818 East Forest Hills Boulevard Paul Horowicz (1961), Ph.D. (Johns Hopkins) Associate Professor of Physiology 216 West Woodridge Drive Edward S. Horton (1966), M.D. (Harvard) Associate in Medicine 107 Newell Street Theresa Elizabeth Horton (1964), M.S.N.E. (Pittsburgh) Apartment 3 Assistant Professor of Nursing 810 Clarendon Street J. Woodford Howard, Jr. (1962), Ph.D. (Princeton) Associate Professor of Political Science 2617 Princeton Drive Max G. Huber (1966), Ph.D. (Freiburg) Apartment 19 Visiting Assistant Professor of Physics 301 Swift Avenue William R. Hudson (1961), M.D. (Bowman Gray) Professor of Otolaryngology 1102 Englewood Avenue Alexander Hull (1962), Ph.D. (Washington) Associate Professor of Romance Languages 2318 Prince Street Earle R. Hunt (1964), Ph.D. (Rutgers) Assistant Professor of Physics 1030 West Trinity Avenue Mrs. Wanda Sanborn Hunter (1947), Ph.D. (California) 2723 Brown Avenue Associate Professor of Zoology Apartment D, Poplar Apartments Allan S. Hurlburt (1956), Ph.D. (Cornell) Professor of Education 112 Buchanan Boulevard Mary Martin Huse (1959), Ph.D. (Duke) Assistant Professor of Medical Psychology in Department of Psychiatry and Lecturer in Psychology Ephesus Chapel Road O. Kelly Ingram (1959), B.D. (Duke) Associate Professor of Applied Theology 2728 Sevier Street Wallace Jackson (1965), Ph.D. (Pennsylvania) Assistant Professor of English 1006 West Knox Street Ann Madeline Jacobansky (1953), M.Ed. (Pittsburgh) Professor of Nursing 1200 Leon Apartments Peter Walter Jeffs (1964), Ph.D. (Natal) Assistant Professor of Chemistry 3209 Cromwell Road Marianna Duncan Jenkins (1948), Ph.D. (Byrn Mawr) Associate Professor of Art 1000 N. Duke Street Alan W. Jenks (1966), Th.D. (Harvard) Visiting Assistant Professor of Religion 1025 Dacian Avenue Edward M. Jennings, III (1965), Ph.D. (Wisconsin) Assistant Professor of English 2951 Friendship Road

Bronislas de Leval Jezierski (1958), Ph.D. (Harvard) Associate Professor of Slavic Literatures 3800 Hillgrand Drive John P. Jimenez (1965), M.D. (Medical College of Virginia) Associate in Radiology 1911-C House Avenue, Apartment 55 Frans F. Jobsis (1964), Ph.D. (Michigan) 1542 Hermitage Court Assistant Professor of Physiology

Frederick Charles Joerg (1947), M.B.A. (Harvard) 2424 Wrightwood Avenue Professor of Economics Charles B. Johnson (1956), Ed.D. (Duke) 2714 McDowell Street Associate Professor of Education Edward Anthony Johnson (1963), B.S. (Sheffield) Associate Professor of Pliarmacology 1408 Shepherd Street Terry Walter Johnson, Jr. (1954), Ph.D. (Michigan) 2408 Prince Street Professor of Botany Irwin S. Johnsrude (1966), M.D. (Manitoba) Assistant Professor of Radiology 1022 Gloria Avenue John Devereaux Johnston (1962), LL.B. (Duke) Associate Professor of Law 2810 Chelsea Circle William Webb Johnston (1963), M.D. (Duke) Assistant Professor of Pathology 1025 Monmouth Avenue William T. Joines (1966), Ph.D. (Duke) Assistant Professor of Electrical Engineering 4010 Deepwood Circle Barney L. Jones (1956), B.D., Ph.D. (Duke) Associate Professor of Religion 2622 Pickett Road Buford Jones (1962), Ph.D. (Harvard) 908 West Markham Avenue Assistant Professor of English Edward Ellsworth Jones (1953), Ph.D. (Harvard) 2738 Sevier Street Professor of Psychology James David Jones (1963), M.D. (Duke) Assistant Professor of Psychiatry and 3851 Somerset Drive Associate in Pediatrics Leon Lloyd Jones (1963), Ph.D. (Utah) Assistant Professor of Chemistry 2610 Indian Trail Oliver William Jones, Jr. (1963), M.D. (Oklahoma) Assistant Professor of Medicine Route 1, Erwin Road Archibald Currie Jordan (1925), M.A. (Columbia) Assistant Professor of English 147 Pinecrest Road Helen Louise Kaiser (1943), R.P.T. (Harvard) 1201 Dwire Place Associate Professor of Physical Therapy William Arthur Kale (1952), B.D. (Duke) Professor of Christian Education 500 East Markham Avenue Henry Kamin (1948), Ph.D. (Duke) Professor of Biochemistry 2417 Perkins Road Nathan Kaufman (1960), M.D. (McGill) Professor of Pathology 2332 Sevier Street Charles Rush Keith (1963), M.D. (Kansas) Assistant Professor of Psychiatry Route 1, Chapel Hill, N. C. Thomas F. Keller (1959), Ph.D. (Michigan) Associate Professor of Economics 1024 West Markham Avenuc Walter Kempner (1934), M.D. (Heidelberg) Professor of Medicine 1505 Virginia Avenue Patrick Dan Kenan (1965), M.D. (Duke) Assistant Professor of Otolaryngology 114 Newell Street Patricia Kennedy (1966), M.S. (Emory) Instructor in Nursing 900 W. Trinity Avenue Van Leslie Kenyon, Jr. (1945), M.M.E. (Virginia) Route 2 Professor of Mechanical Engineering Hillsborough, N. C. Grace Pardridge Kerby (1947), M.D. (Duke) 1108 Wells Street Professor of Medicine

1511 Pinecrest Road

Alan C. Kerckhoff (1958), Ph.D. (Wisconsin)

Professor of Sociology

Robert B. Kerr (1965), Ph.D. (Johns Hopkins) Associate Professor of Electrical Engineering 2220 Elmwood Avenue Kave H. Kilburn (1962), M.D. (Utah) Associate Professor of Medicine 1 V.A. Staff Apartments Seuk Ky Kim (1963), M.D. (Severance) Assistant Professor of Radiology E-2 1200 Leon Street Gregory Adams Kimble (1952), Ph.D. (Iowa State) Professor of Psychology 2513 Wrightwood Avenue Thomas DeArman Kinney (1960), M.D. (Duke) Professor of Pathology 3120 Devon Road Kay C. Kintzel (1965), M.S. (Pennsylvania) University Gardens Apartments Instructor in Nursing Chapel Hill, N. C. Norman Kirshner (1956), Ph.D. (Pennsylvania State) Associate Professor of Biochemistry 2524 Wrightwood Avenue Joseph Weston Kitchen, Jr. (1962), Ph.D. (Harvard) Assistant Professor of Mathematics 1600 Delaware Avenue Gunter Klabes (1965), B.A. (Freiburg, Germany) Instructor in German 801 Underwood Avenue Robert Frederick Klein (1963), M.D. (Alabama) Assistant Professor of Medicine 2740 Spencer Street Gordon K. Klintworth (1964) Assistant Professor of Pathology 614 Starmount Drive Peter H. Klopfer (1958), Ph.D. (Yale) Associate Professor of Zoology Route 1, Box 293 Conrad Merton Knight (1961), B.S. (Norwich) Associate in Preventive Medicine 4603 Blanchard Road Douglas Maitland Knight (1963), Ph.D. (Yale), Litt.D., LL.D., L.H.D. Professor of English 1508 Pinecrest Road Kenneth R. Knoerr (1961), Ph.D. (Yale) Professor of Forest Meteorology 4429 Ryan Road Allan Kornberg (1965), Ph.D. (Michigan) Assistant Professor of Political Science 2310 Prince Street Wesley Kort (1965), Ph.D. (Chicago) Visiting Assistant Professor of Religion 3514 Winding Way Jack L. Kostyo (1959), Ph.D. (Cornell) Professor of Physiology 604 Starmount Drive Paul Jackson Kramer (1931), Ph.D. (Ohio State) James B. Duke Professor of Botany 2251 Cranford Drive Frederick H. Krantz (1965), A.B. (Columbia) Instructor in History 808 Berkeley Street Edward Kready Kraybill (1939), Ph.D. (Michigan) Associate Professor of Electrical Engineering 2726 Circle Drive Irwin Kremen (1963), Ph.D. (Harvard) Assistant Professor of Psychology and Assistant Professor of Medical Psychology in the Department of Psychiatry 216 Forestwood Drive William B. Kremer (1966), M.D. (Upstate Medical School) Route 2 Associate in Medicine Hillsborough, N. C. Mrs. Juanita M. Kreps (1955), Ph.D. (Duke) Morgan Creek Road Associate Professor of Economics Chapel Hill, N. C. William R. Krigbaum (1952), Ph.D. (Illinois), D.Sc. Professor of Chemistry 2504 Wilson Street Robert C. Krueger (1961), D.Phil. (Oxon.) Assistant Professor of English Route 2, Box 388A

Arnold D. Krugman (1964), Ph.D. (Kentucky) Assistant Professor of Medical Psychology in the Department of Psychiatry and Lecturer in Psychology 2605 Tanglewood Drive Magnus Jan Krynski (1966), Ph.D. (Columbia) Associate Professor of Slavic Literatures 405 Watts Street W. W. Kulski (1963), LL.D. (Paris) James B. Duke Professor of Russian Affairs 1624 Marion Avenue Sudhir Kumar (1959), Ph.D. (Pennsylvania) Visiting Associate Professor of Civil Engineering 2014 Sprunt Street Johannes A. Kylstra (1965), Ph.D. (Leiden) Assistant Professor of Medicine and Assistant Professor of Physiology 2007 House Avenue Mrs. Maurine Boie LaBarre (1961), M.S.W. (Bryn Mawr) Assistant Professor of Psychiatric Social Work Mt. Sinai Road, Route 1 Weston La Barre (1946), Ph.D. (Yale) Professor of Anthropology Mt. Sinai Road, Route 1 Leon Lack (1965), Ph.D. (Columbia) Assistant Professor of Pharmacology 1521 Hermitage Court Creighton Lacy (1953), B.D., Ph.D. (Yale) Professor of World Christianity 2714 Dogwood Road Martin Lakin (1958), Ph.D. (Chicago) Associate Professor of Medical Psychology in Department of Psychiatry and Associate Professor of Psychology 2709 McDowell Street *Harold Langenderfer (1966), D.B.A. (Indiana) 1011 Highland Woods Professor of Parasitology Chapel Hill, N. C. Thomas A. Langford (1956), B.D., Ph.D. (Duke) Associate Professor of Religion 2002 Dartmouth Drive John Tate Lanning (1927), Ph.D. (California) James B. Duke Professor of History 3007 Surrey Road John E. Larsh, Jr. (1943), Sc.D. (Johns Hopkins) Memorial Hospital Professor of Parasitology Chapel Hill, N.C. Arthur Larson (1958), D.C.L. (Oxon.) Professor of Law 3408 Dover Road John Laszlo (1960), M.D. (Harvard) Associate Professor of Medicine Cornwallis Road Elvin Remus Latty (1937), J.Sc.D. (Columbia) William R. Perkins Professor of Law 3620 Hathaway Road William D. Lawing (1966), Ph.D. (Iowa State) 3421 Huntleigh Drive Raleigh, N. C. Adjunct Assistant Professor of Mathematics Patricia Lawrence (1964), M.A. (Columbia) Assistant Professor of Nursing 4711 Easley Street Richard H. Leach (1955), Ph.D. (Princeton) Professor of Political Science 1313 Woodburn Road John LeBar (1965), M.S. (Kansas State Teachers College) Assistant Professor of Physical Education 923 Demerius Street Harold E. Lebovitz (1962), M.D. (Pittsburgh) Associate Professor of Medicine 1900 Dartmouth Drive Chien Ping Lee (1966), Ph.D. (Duke) Associate in Physiology 2501 West Club Boulevard John C. LeMay (1961), D.V.M. (Georgia) Goodwin Road Assistant Professor of Veterinary Medicine Route 2, Box 214 Warren Lerner (1961), Ph.D. (Columbia)

2104 Dartmouth Drive

Associate Professor of History

Through Fall Term 1966

Richard G. Lester (1965), M.D. (Columbia) Professor of Radiology 2703 Montgomery Avenue Donald S. Leventhal (1965), Ph.D. (Purdue) Associate in Medical Psychology 4002 Hillgrand Circle Robert J. Levy (1966), M.A. (Boston) Instructor in Philosophy 636 W. Club Boulevard Harold Walter Lewis (1946), Ph.D. (Duke) Professor of Physics 2307 Sprunt Street Martha Modena Lewis (1933), M.A. (Columbia) Professor of Physical Education 407 Erwin Apartments Ralph Elton Lewis (1941), M.S. in M.E. (Illinois) Assistant Professor of Mechanical Engineering 1401 Alabama Avenue John L. Lievsay (1962), Ph.D. (Washington) Professor of English 2725 Montgomery Street Darwyn E. Linder (1965), Ph.D. (Minnesota) Assistant Professor of Psychology 4029 Nottaway Road L. Sigfred Linderoth (1965), M.E. (Iowa State) Professor of Mechanical Engineering 2220 Whitley Drive Paul W. Lindloff, Jr. (1966), Ph.D. (Texas) Apartment 20 Visiting Associate Professor of Economics 301 Swift Avenue Herman P. Lineberger (1966), M.D. (North Carolina) 308 Hemlock Drive Associate in Psychiatry Chapel Hill, N. C. Charles Harris Livengood, Jr. (1946), LL.B. (Harvard) Professor of Law 2804 Chelsea Circle Daniel A. Livingstone (1956), Ph.D. (Yale) Associate Professor of Zoology 626 Starmount Drive Charles E. Llewellyn, Jr. (1955), M.D. (Medical College of Virginia) 3550 Hamstead Court Associate Professor of Psychiatry Jane Marie Lloyd (1961), M.A. (North Carolina) Assistant Professor of Physical Education 704 Louise Circle Gregory Lockheed (1965), Ph.D. (Johns Hopkins) Assistant Professor of Psychology 101 Emerald Circle Ernest Croft Long (1956), M.B., B.S., Ph.D. (London) Professor of Preventive Medicine, Associate Professor of Physiology and Pharmacology, and Associate in Pediatrics Route 1, Box 204B, Erwin Road Hans Löwenbach (1940), M.D. (Hamburg) Professor of Psychiatry and Assistant Route 3, Box 309, Old Apex Road Professor of Pediatrics Charles Lucien Baker Lowndes (1934), S.J.D. (Harvard) James B. Duke Professor of Law 2016 Club Boulevard Zolton J. Lucas (1965), M.D. (Johns Hopkins) 126 Pinecrest Road Assistant Professor of Surgery William S. Lynn, Jr. (1954), M.D. (Columbia) Professor of Medicine and Associate Professor of Biochemistry 4014 Bristol Road George W. Lynts (1965), Ph.D. (Wisconsin) Assistant Professor of Geology 3328 Rolling Hill Road Angus M. McBryde (1931), M.D. (Pennsylvania) Professor of Pediatrics 3406 Westover Road Kenneth Scott McCarty (1959), Ph.D. (Columbia) Associate Professor of Biochemistry 2713 Dogwood Road Richard V. McCloskey (1965), M.D. (Rochester) Assistant Professor of Medicine and Instructor in Microbiology and Immunology 2709 Farthing Street

Dianna McClung (1966), B.A. (North Carolina) 29 Oakwood Drive Instructor in German Chapel Hill, N. C. Thomas E. McCollough (1961), Th.D. (Southern Baptist Theological Seminary) Associate Professor of Religion 2227 Cranford Road Donald E. McCollum (1962), M.D. (Bowman Gray) Assistant Professor of Orthopedic Surgery 2207 Wilshire Drive William Charles McCormack (1964), Ph.D. (Chicago) 1326 Welcome Circle Associate Professor of Sociology Alice L. McCrea (1961), M.S. (Chicago) Assistant Professor of Radiation Therapy Route 2, Umstead Road Betty Foster McCue (1964), Ph.D. (Iowa State) Professor of Physical Education 3349 Denise Street Frederick D. McFalls (1962), M.D. (Duke) Assistant Professor of Anatomy 911 Morehead Avenue John S. McGee (1962), Ph.D. (Vanderbilt) Professor of Economics 2704 Sevier Street Gelolo McHugh (1946), Ph.D. (Columbia) Associate Professor of Psychology 1010 Monmouth Avenue Henry Deane McIntosh (1955), M.D. (Pennsylvania) Professor of Medicine 2705 Stuart Drive John C. McKinney (1957), Ph.D. (Michigan) Professor of Sociology and Professor of Medical Sociology in Department of Psychiatry 1627 Marion Avenue Mary Helen McLachlan (1958), M.A. (Missouri) Associate Professor of Dietetics 2022 Bivins Street Michael E. McLeod (1966), M.D. (Duke) Associate in Medicine 4007 Deepwood Circle Thomas Joseph McManus (1961), M.D. (Boston) Assistant Professor of Physiology and Pharmacology 1408 Oakland Avenue Robert E. McMasters (1966), M.D. (Texas) Apartment 28 Associate in Anatomy and Associate in Neurology 1100 Leon Street Harry Thurman McPherson (1955), M.D. (Duke) Associate Professor of Medicine 3915 Nottaway Road John Nelson Macduff (1956), M.M.E. (New York) Professor of Mechanical Engineering 2733 Dogwood Road George L. Maddox (1960), Ph.D. (Michigan State) Professor of Sociology and Professor of Medical Sociology in Department of Psychiatry 2750 McDowell Street Moses S. Mahaley (1965), Ph.D. (Duke) Assistant Professor of Neurology, and Assistant Professor of Anatomy 3534 Hamstead Court Edward P. Mahoney (1965), M.A. (Columbia) Assistant Professor of Philosophy 918 Monmouth Avenue Alan Krebs Manchester (1929), Ph.D. (Duke) Professor of History 406 Swift Avenue R. B. Manikam (1966), Ph.D. (Columbia) Visiting Professor of World Christianity Joseph Eldridge Markee (1943), Ph.D. (Chicago) James B. Duke Professor of Anatomy 1015 Demerius Street Sidney David Markman (1947), Ph.D. (Columbia) Professor of Art History and Archaeology 919 Urban Avenue George Eric Marler (1963), M.D.C.M. (McGill) 177 Larch Road Associate in Medicine and Associate in Biochemistry Briarcliff Manor, N. Y.

Robert M. Marsh (1965), Ph.D. (Columbia) Associate Professor of Sociology 2511 Perkins Road David V. Martin (1962), Ed.D. (Duke) Assistant Professor of Education 2312 Wilson Street Raymond Massengill, Jr. (1964), Ph.D. (Virginia) Associate in Medical Speech Pathology in the Department of Surgery 2734 Spencer Street Seymour Mauskopf (1964), Ph.D. (Princeton) Assistant Professor of History 1700 Hillcrest Drive William Cary Maxwell (1930), Ph.D. (Heidelberg) Associate Professor of German 142 Pinecrest Road Demmie G. Mayfield (1964), M.D. (Texas) Assistant Professor of Psychiatry Apartment 3-301 West Trinity Avenue Otto Meier, Jr. (1934), Ph.D. (Pennsylvania) Professor of Electrical Engineering 113 Pinecrest Road Elgin W. Mellown (1965), Ph.D. (London) Assistant Professor of English 1108 Minerva Avenue Elijah Eugene Menefee, Jr. (1940), M.D. (Duke) Professor of Medicine 2205 Cranford Road Robert J. Menzies (1962), Ph.D. (California) Mitchell Village Professor of Zoology Beaufort, N. C. James L. Meriam (1963), Ph.D. (Yale) Professor of Engineering Mechanics 3434 Rugby Road Richard S. Metzgar (1962), Ph.D. (Buffalo) Associate Professor of Immunology 3613 Westover Road Horst Meyer (1959), Docteur ès Sciences (Geneva) Professor of Physics 1411 Anderson Street M. Victor Michalak (1950), Ph.D. (Indiana) Assistant Professor of English 804 Louise Circle Gustavus H. Miller (1955), Ph.D. (Michigan) Bartram Drive Assistant Professor of Romance Languages Chapel Hill, N. C. Robert W. Miller (1966), M.A. (Western Ontario) Greenwood Apartments Instructor in Political Science 808 Green Street Wilma A. Minniear (1964), M.S.N. (Western Reserve) Associate Professor of Nursing Box 3427, Duke Hospital Margaret Elizabeth Mitchell (1957), M.Ed. (North Carolina State) Instructor in Nursing 2728 Brown Avenue Gerald C. Monsman (1965), Ph.D. (Johns Hopkins) Apartment 6 Philip Apartments, 307 West Trinity Avenue Assistant Professor of English Donald M. Monson (1962), M.D. (Wisconsin) Adjunct Assistant Professor of Radiology 2615 Stuart Drive John W. Moore (1961), Ph.D. (Virginia) Kenmore Road Professor of Physiology Chapel Hill, N. C. Lawrence C. Moore, Jr. (1966), Ph.D. (California Institute of Technology) Assistant Professor of Mathematics 2402 Lednum Street, Apartment C William Hamilton Moore (1963), Ph.D. (Harvard) 2802 Erwin Road Assistant Professor of English *James Joseph Morris (1963), M.D. (New York State) 3711 Tremont Drive Assistant Professor of Medicine Montrose J. Moses (1959), Ph.D. (Columbia) Associate Professor of Anatomy 152 Pinecrest Road Earl George Mueller (1945), Ph.D. (Iowa) 1001 Gloria Avenue Associate Professor of Art

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Directory of Officers, Faculty, Staff . 29

Mrs. Julia Wilkinson Mueller (1939-41; 1946), M.A. (Iowa) Professor of Music 1001 Gloria Avenue Daniel F. Murphy (1966), Ph.D. (Rochester) Associate in Medical Psychology in Department of Psychiatry Francis J. Murray (1960), Ph.D. (Columbia) Professor of Mathematics 1011 Homer Street A. Wendell Musser (1963), M.D. (Indiana) Assistant Professor of Pathology 2403 Wrightwood Avenue Marc J. Musser (1966), M.D. (Wisconsin) Professor of Medicine 2617 McDowell Street Hiroshi Nagaya (1966), M.D. (Tokyo) Apartment F 1003 Sherwood Drive Associate in Medicine Toshio Narahashi (1965), Ph.D. (Tokyo) Assistant Professor of Physiology 891 Louise Circle Thomas H. Nash, Jr. (1959), B.S.M.E. (Iowa State) Assistant Professor of Mechanical Engineering 2527 Wrightwood Avenue Blaine S. Nashold, Jr. (1957), M.D. (McGill) Assistant Professor of Surgery in Division of Neurosurgery 410 East Forest Hills Boulevard Sydney H. Nathans (1966), M.A. (Johns Hopkins) 711 Greenwood Road Chapel Hill, N. C. Instructor in History Dorothy E. Naumann (1963), M.D. (Syracuse) Associate in Preventive Medicine 2404 Tampa Avenue Aubrey Willard Naylor (1952), Ph.D. (Chicago) Professor of Botany 2430 Wrightwood Avenue Thomas Herbert Naylor (1964), Ph.D. (Tulane) Associate Professor of Economics 2727 Spencer Street Bohdan Nechay (1966), D.V.M. (Minnesota) Assistant Professor of Pharmacology and Assistant Professor of Experimental Urology 1911 House Avenue Stanley S. Needell (1965), M.D. (Virginia) Assistant Professor of Psychiatry 1400 Welcome Circle Glenn Robert Negley (1946), Ph.D. (Chicago) Professor of Philosophy 3610 Hathaway Road Roland H. Nelson (1965), Ed.D. (Harvard) Professor of Education 2431 Tryon Road M. Wilson Nesbitt, Jr. (1957), B.D. (Duke), D.D. Associate Professor of the Work of the Rural Church 1609 Peace Street Charles W. Neville, Jr. (1964), M.D. (Vanderbilt) Highland Hospital Assistant Professor of Psychiatry Asheville, N. C. Barbara Carol Newborg (1952), M.D. (Johns Hopkins) Associate in Medicine 1503 Virginia Avenue Henry Winston Newson (1948), Ph.D. (Chicago) Professor of Physics 1111 North Gregson Street William McNeal Nicholson (1935), M.D. (Johns Hopkins) Professor of Medicine 824 Anderson Street R. Bruce Nicklas (1965), Ph.D. (Columbia) Associate Professor of Zoology 3101 Camelot Court Nancy Nolan (1964), M.Sc. (Ohio State) Assistant Professor of Nursing 705 Louise Circle 4619 Blanchard Road Loren W. Nolte (1966), Ph.D. (Michigan) Assistant Professor of Electrical Engineering Parkwood Sue Norville (1966), M.S.N. (Emory) Assistant Professor of Nursing 705 Louise Circle Yasuhiko Nozaki (1966), Ph.D. (Tokyo) Associate in Biochemistry 2720 Erwin Road Holger Olof Nygard (1960), Ph.D. (California) Professor of English Route 2, Cole Mill Road Walter D. Obrist (1957), Ph.D. (Northwestern) Professor of Medical Psychology in Department of Psychiatry and Lecturer in Psychology 2604 McDowell Street Guy Leary Odom (1943), M.D. (Tulane) Professor of Neurosurgery 2812 Chelsea Circle William M. O'Fallon (1965), Ph.D. (Vanderbilt) Glen Heights Chapel Hill, N. C. Assistant Professor of Preventive Medicine Billy Brown Olive (1960), B.S.E.E., LL.B. (St. Johns) Lecturer in Electrical Engineering Box 280-2, Route 1 F. Hodge O'Neal (1959), S.J.D. (Harvard) Professor of Law Box 284A, Mt. Sinai Road Henry J. Oosting (1932), Ph.D. (Minnesota) Professor of Botany 2642 University Drive Edward Stewart Orgain (1934), M.D. (Virginia) Professor of Medicine 3321 Devon Road Robert Tappan Osborn (1954), B.D., Ph.D. (Drew) Associate Professor of Religion 2732 McDowell Street James G. Osborne (1961), B.S. (California) Professor of Forest Biometry 2756 McDowell Street Suydan Osterhout (1959), M.D., Ph.D. (Rockefeller Institute) Associate Professor of Microbiology and Assistant Professor of Medicine 600 Starmount Drive Athos Ottolenghi (1959), M.D. (Tavia) Associate Professor of Pharmacology 918 Green Street Harry Ashton Owen, Jr. (1961), Ph.D. (North Carolina State) Professor of Electrical Engineering 2741 McDowell Street J. B. B. Owen (1966), D.Sc. (Oxon.) Visiting Professor of Civil Engineering 1621 Marion Avenue George Padilla (1965), Ph.D. (California) Assistant Professor of Physiology Wilmington, N. C. Aubrey Edwin Palmer (1944), B.S., C.E. (Virginia) Associate Professor of Civil Engineering 2525 Highland Avenue Richard A. Palmer (1966), Ph.D. (Illinois) Assistant Professor of Chemistry 2904 Getmar Drive Harold Talbot Parker (1939), Ph.D. (Chicago) Professor of History 923 Dacian Avenue Roy T. Parker (1954), M.D. (Virginia) Professor of Obstetrics and Gynecology 111 Pinecrest Road Harry B. Partin (1964), Ph.D. (Chicago) Assistant Professor of Religion 2739 Spencer Street Joel Francis Paschal (1954), Ph.D. (Princeton) Professor of Law 1527 Pinecrest Road Merrill Lee Patrick (1964), Ph.D. (Carnegie Institute of Technology) Assistant Professor of Mathematics A-4 1200 Leon Street Ransom Rathbone Patrick (1954), Ph.D. (Princeton) Professor of Art History 116 Pinecrest Road Lewis Patton (1926), Ph.D. (Yale) Professor of English 614 Swift Avenue Hilda I. Pavlov (1960), M.A. (Leningrad)

Assistant Professor of Russian

709 Reta Road

Michael I. Pavlov (1960), M.A. (Leningrad) Assistant Professor of Russian 709 Reta Road William Bernard Peach (1951), Ph.D. (Harvard) Professor of Philosophy 920 Dacian Avenue George W. Pearsall (1964), Sc.D. (Massachusetts Institute of Technology) Professor of Mechanical Engineering 2941 Welcome Drive Talmage Lee Peele (1939), M.D. (Duke) Professor of Anatomy, Associate Professor of Neurology, Assistant Professor of Pediatrics, and Lecturer in Psychology KD2 University Apartments Charles Henry Peete, Jr. (1953), M.D. (Harvard) Associate Professor of Obstetrics and Gynecology 42 Beverly Drive William P. J. Peete (1955), M.D. (Harvard) Professor of Surgery 2814 Chelsea Circle Jacques H. Perivier (1965), Ph.D. (Pennsylvania) Four Seasons Apartments Assistant Professor of Romance Languages 1911 House Avenue Harold Sanford Perry (1932), Ph.D. (Cornell) Professor of Botany 2302 Cranford Road Edythe Mae Persing (1964), M.N. (Western Reserve) Assistant Professor of Nursing Route 2, Chapel Hill, N. C. Elbert Lapsley Persons (1930), M.D. (Harvard) Professor of Medicine and Associate Professor of Preventive Medicine and Public Health 723 Anderson Street Walter Scott Persons (1930), A.B. (Duke) Associate Professor of Physical Education 612 Swift Avenue Ernst Peschel (1953), M.D. (Berlin) Associate Professor of Medicine 2306 Pershing Street Anton Peterlin (1961), Ph.D. (Berlin) 1212 Arnette Avenue Adjunct Professor of Chemistry Ray C. Petry (1937), Ph.D. (Chicago) James B. Duke Professor of Church History 128 Pinecrest Road Olan Lee Petty (1952), Ph.D. (Iowa) Professor of Education 2605 McDowell Street Eric A. Pfeiffer (1966), M.D. (Washington) Associate in Psychiatry 3203 Cromwell Road John Bernard Pfeiffer, Jr. (1949), M.D. (Cornell) Associate Professor of Medicine 3414 Rugby Road Leland R. Phelps (1961), Ph.D. (Ohio State) Associate Professor of German 2255 Cranford Road Frances C. Phillips (1965), M.S. (North Carolina) 5 Powell Street Instructor in Nursing Chapel Hill, N. C. James Henry Phillips (1946), Ph.D. (Yale) Associate Professor of Religion 2517 Perkins Road Roberta Phillips (1965), M.S.N.E. (North Carolina) Colonial Apartments Assistant Professor of Nursing Chapel Hill, N. C. Jane Philpott (1951), Ph.D. (Iowa State) Associate Professor of Botany 2260 Cranford Road Henry Floyd Pickett (1935), A.B. Associate in Medical Art and Illustration and Photographer 1212 West Cornwallis Road Kenneth LeRoy Pickrell (1944), M.D. (Johns Hopkins)

Orrin H. Pilkey (1965), Ph.D. (Florida)

Assistant Professor of Geology 3109 Sherbon Drive

3 Sylvan Road

Professor of Plastic Surgery

Theo Clyde Pilkington (1961), Ph.D. (Duke) Associate Professor of Electrical Engineering 4725 Stafford Drive Otto A. Piper (1967), Th.D. (Gottingen), D.D., LL.D. Visiting Professor of New Testament 406 Swift Avenue Jacques C. Poirier (1955), Ph.D. (Chicago) Associate Professor of Chemistry 210 West Lavender Street Barbara A. Pope (1966), M.S.S.W. (Richmond Professional Institute) Associate in Psychiatric Social Work 890 Louise Circle F. Stanley Porter (1964), M.D. (Johns Hopkins) Associate Professor of Pediatrics 2607 Cornwallis Road Richard M. Portwood (1959), M.D. (Southwestern) Assistant Professor of Medicine and Assistant Professor of Preventive Medicine 1720 Vista Street Raymond W. Postlethwait (1955), M.D. (Duke) Professor of Surgery 1513 Pinecrest Road William H. Poteat (1960), B.D., Ph.D. (Duke) 621 Greenwood Road Professor of Christianity and Culture Chapel Hill, N. C. Albert H. Powell, Jr. (1965), M.D. (Duke) Associate in Psychiatry 3429 Dover Road Benjamin E. Powell (1946), Ph.D. (Chicago) Professor in the Faculty of Arts and Sciences 3609 Hathaway Road Philip C. Pratt (1966), M.D. (Johns Hopkins) Associate Professor of Pathology 2707 Sevier Street Vernon Pratt (1964), M.F.A. (San Francisco Art Institute) Instructor in Art 701 Cornwallis Road Richard Lionel Predmore (1950), D.M.L. (Middlebury) Professor of Romance Languages 2535 Sevier Street Jack J. Preiss (1959), Ph.D. (Michigan State) Associate Professor of Sociology and Associate Professor of Medical Sociology in Department of Psychiatry 2722 McDowell Street Richard A. Preston (1965), Ph.D. (Yale) William K. Boyd Professor of History 1124 Woodburn Road James Ligon Price, Jr. (1952), Ph.D. (Cantab.) Professor of Religion 2723 Circle Drive Reynolds Price (1958), B.Litt. (Oxon.) Assistant Professor of English Box 4813 Duke Station Jesse Harris Proctor, Jr. (1958), Ph.D. (Harvard) Professor of Political Science 613 Swift Avenue Ruth Register Proctor (1964), M.S.N. (Duke) Assistant Professor of Nursing 2.417 Dellwood Street Jack Hale Prost (1966), Ph.D. (Chicago) Assistant Professor of Anatomy 407 Swift Avenue A. Kenneth Pye (1966), LL.M. (Georgetown) Professor of Law Louis D. Quin (1956), Ph.D. (North Carolina) Associate Professor of Chemistry 2740 McDowell Street Galen W. Quinn (1957), D.D.S. (Tennessee) Professor of Orthodontics 806 East Forest Hills Boulevard Milton Raben (1964), M.D. (Tufts) Assistant Professor of Radiation Therapy 2611 McDowell Street K. V. Rajagopalan (1966), Ph.D. (Madras) Assistant Professor of Biochemistry 1616 Ward Street Charles W. Ralston (1953), Ph.D. (Duke) Professor of Forest Soils 2531 Wrightwood Avenue

Dale B. J. Randall (1957), Ph.D. (Pennsylvania) Associate Professor of English 2620 University Drive Robert Stanley Rankin (1927), Ph.D. (Princeton) Professor of Political Science 1227 Vickers Avenue Israel Thomas Reamer (1931), Ph.D. (Maryland) Associate in Pharmacy 2406 West Club Boulevard Kenneth James Reardon (1947), M.A. (Boston) Associate Professor of English 2511 Winton Road John B. Reckless (1963), M.D. (Birmingham) Assistant Professor of Psychiatry 2437 Tryon Road Wallace E. Reed (1965), M.S. (Illinois) Assistant Professor of Economics 2508 Sevier Street Robert James Reeves (1930), M.D. (Baylor) Professor of Radiology 920 Anderson Street Barbara Z. Renkin (1963), Ph.D. (Johns Hopkins) Associate in Physiology 2809 Legion Avenue Eugene M. Renkin (1963), Ph.D. (Harvard) Professor of Pharmacology and Head of the Division of Pharmacology in Department of Physiology and Pharmacology 2809 Legion Avenue A. W. Renuart (1966), M.D. (Duke) Associate in Pediatrics Thomas D. Reynolds (1953), Ph.D. (Duke) Associate Professor of Mathematics 2502 Wrightwood Avenue John McFarlane Rhoads (1956), M.D. (Temple) Professor of Psychiatry and Lecturer of Pastoral Care in Divinity School 2404 Prince Street Charles L. Rice (1963), S.T.M. (Union Theological Seminary) A-2 Graham Court Chapel Hill, N. C. Instructor in Preaching Reed P. Rice (1965), M.D. (Indiana) 716 Kenmore Road Assistant Professor of Radiology Chapel Hill, N. C. Lawrence Richardson, Jr. (1966), Ph.D. (Yale) Professor of Latin 1103 North Gregson Street McMurry S. Richey (1954), B.D., Ph.D. (Duke) Professor of Theology and Christian Nurture 2725 Dogwood Road Mac L. Ricketts (1965), Ph.D. (Chicago) 3318 Dixon Road Visiting Assistant Professor of Religion John D. Riebel (1962), M.A. 60 Oakwood Drive Associate in Physical Therapy Chapel Hill, N. C. Dana Phelps Ripley (1959), Ph.D. (North Carolina) Assistant Professor of Romance Languages 1303 Dollar Avenue Nathan Russell Roberson (1963), Ph.D. (Johns Hopkins) Assistant Professor of Physics 3406 Ogburn Court John Henderson Roberts (1931), Ph.D. (Texas) Professor of Mathematics 2813 Legion Avenue J. David Robertson (1966), M.D. (Harvard), Ph.D. (Mass. Institute of Technology) Professor of Anatomy 32 Oak Drive, Forest Hills Charles K. Robinson (1961), B.D., Ph.D. (Duke) Assistant Professor of Philosophical Theology 126 Emerald Circle Hugh G. Robinson (1964), Ph.D. (Duke) Associate Professor of Physics 2749 McDowell Street Roscoe R. Robinson (1962), M.D. (Oklahoma) Associate Professor of Medicine 3929 Nottaway Road Herman Robl (1966), Ph.D. (Vienna) Adjunct Professor of Physics 2008 West Club Boulevard

Charles A. Rogers (1965), B.D. (Perkins School of Theology Robert Samuel Rogers (1937), Ph.D. (Princeton), F.A.A.R. Professor of Latin Theodore Ropp (1938), Ph.D. (Harvard) Professor of History Theodore Rosett (1959), Ph.D. (London) Assistant Professor of Biochemistry Norman F. Ross (1937), D.D.S. (Temple) Associate Professor of Dentistry Wendell F. Rosse (1966), M.D. (Chicago) Assistant Professor of Medicine Annette T. Rottenberg (1965), Ph.D. (Harvard) Professor of Economics William Leal Rowe (1963), Ph.D. (Cornell) Associate Professor of Authropology David T. Rowlands, Jr. (1966), M.D. (Pennsylvania) Associate Professor of Sociology John Jesse Rudin, II (1945), B.D., Ph.D. (Chicago) Assistant Professor of Sociology John Jesse Rudin, II (1945), B.D., Ph.D. (Northwestern) Associate Professor of Speech and Worship Mabel F. Rudisill (1948), Ph.D. (Wisconsin) Associate Professor of Education Julian Meade Ruffin (1930), M.D. (Virginia) Professor of Medicine Max R. Rumelhart (1965), B.Ed. (Gonzaga) Assistant Professor of Surgery Harvey J. Sage (1964), Ph.D. (Yale) Assistant Professor of Pathology and Associate Professor of Pathology and Associa		
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Assistant Professor of Biochemistry Norman F. Ross (1937), D.D.S. (Temple) Associate Professor of Dentistry Wendell F. Rosse (1966), M.D. (Chicago) Assistant Professor of Medicine Annette T. Rottenberg (1965), M.A. (Harvard) Lecturer in English Simon Rottenberg (1965), Ph.D. (Harvard) Professor of Economics William Leal Rowe (1963), Ph.D. (Cornell) Associate Professor of Anthropology David T. Rowlands, Jr. (1966), M.D. (Pennsylvania) Associate Professor of Pathology Donald Francis Roy (1950), Ph.D. (Chicago) Associate Professor of Speech and Worship Mabel F. Rudisill (1945), B.D., Ph.D. (Northwestern) Associate Professor of Speech and Worship Mabel F. Rudisill (1945), B.D., Ph.D. (Wisconsin) Associate Professor of Education Julian Meade Ruffin (1930), M.D. (Virginia) Professor of Medicine Max R. Rumelhart (1965), B.Ed. (Gonzaga) Assistant Professor of Naval Science Ralph Wayne Rundles (1945), M.D., Ph.D. (Cornell) Professor of Medicine David Coston Sabiston, Jr. (1964), M.D. (Johns Hopkins) Professor of Pathology and Assistant Professor of Biochemistry George Salamon (1966), Ph.D. (Yale) Assistant Professor of Biochemistry George Salamon (1966), Ph.D. (Harvard) Assistant Professor of Biochemistry George Salamon (1966), Ph.D. (Yale) Professor of German Herbert A. Saltzman (1958), M.D. (Philadelphia) Associate Professor of Physiology Associate Professor of Physiology Associate Professor of Radiology Charles Richard Sanders (1937), Ph.D. (Chicago) Professor of English Baxter B. Sapp, Jr. (1960), D.D.S. (Temple) Associate in Dentistry Mrs. Eugenia Curtis Saville (1947), M.A. (Columbia)		302 East Woodridge Drive
Norman F. Ross (1937), D.D.S. (Temple) Associate Professor of Dentistry Wendell F. Rosse (1966), M.D. (Chicago) Assistant Professor of Medicine Annette T. Rottenberg (1965), M.A. (Harvard) Lecturer in English Simon Rottenberg (1965), Ph.D. (Harvard) Professor of Economics William Leal Rowe (1963), Ph.D. (Cornell) Associate Professor of Anthropology David T. Rowlands, J. (1966), M.D. (Pennsylvania) Associate Professor of Pathology Donald Francis Roy (1950), Ph.D. (Chicago) Associate Professor of Sociology John Jesse Rudin, II (1945), B.D., Ph.D. (Northwestern) Associate Professor of Sociology John Jesse Rudin, II (1945), B.D., Ph.D. (Northwestern) Associate Professor of Seech and Worship Mabel F. Rudisill (1948), Ph.D. (Wisconsin) Associate Professor of Education Associate Professor of Naval Science Ralph Wayne Rundles (1945), M.D., Ph.D. (Cornell) Professor of Medicine David Coston Sabiston, Jr. (1964), M.D. (Johns Hopkins) Professor of Surgery Harvey J. Sage (1964), Ph.D. (Yale) Assistant Professor of Biochemistry George Salamon (1966), A.M. (Bryn Mawr) Lecturer in English Herman Salinger (1955), Ph.D. (Yale) Associate Professor of Physiology Asanon P. Sanders (1936), Ph.D. (North Carolina) Associate Professor of Physiology Asanon P. Sanders (1936), Ph.D. (Chicago) Professor of English Baxter B. Sapp, Jr. (1960), D.D.S. (Temple) Associate in Dentistry Mrs. Eugenia Curtis Saville (1947), M.A. (Columbia)		1712 James Street
Associate Professor of Dentistry Wendell F. Rosse (1966), M.D. (Chicago) Assistant Professor of Medicine Annette T. Rottenberg (1965), M.A. (Harvard) Lecturer in English Simon Rottenberg (1965), Ph.D. (Harvard) Professor of Economics William Leal Rowe (1963), Ph.D. (Cornell) Associate Professor of Anthropology David T. Rowlands, Jr. (1966), M.D. (Pennsylvania) Associate Professor of Pathology Donald Francis Roy (1950), Ph.D. (Chicago) Associate Professor of Sociology John Jesse Rudin, II (1945), B.D., Ph.D. (Northwestern) Associate Professor of Speech and Worship Mabel F. Rudisill (1948), Ph.D. (Wisconsin) Associate Professor of Education Professor of Medicine Max R. Rumelhart (1965), B.Ed. (Gonzaga) Assistant Professor of Naval Science Ralph Wayne Rundles (1945), M.D., Ph.D. (Cornell) Professor of Medicine David Coston Sabiston, Jr. (1964), M.D. (Johns Hopkins) Professor of Medicine David Coston Sabiston, Jr. (1964), M.D. (Johns Hopkins) Professor of Pathology and Assistant Professor of Pathology and Assistant Professor of Biochemistry George Salamon (1966), Ph.D. (Yale) Associate Professor of Perman Herbert A. Saltzman (1955), Ph.D. (Yale) Professor of German Herbert A. Saltzman (1958), M.D. (Philadelphia) Associate Professor of Physiology Asnon P. Sanders (1956), Ph.D. (North Carolina) Associate Professor of Physiology Associate Professor of Radiology Charles Richard Sanders (1937), Ph.D. (Chicago) Professor of English Baxter B. Sapp, Jr. (1960), D.D.S. (Temple) Associate in Dentistry Mrs. Eugenia Curtis Saville (1947), M.A. (Columbia)		1713 James Bareet
Assistant Professor of Medicine Annette T. Rottenberg (1965), M.A. (Harvard) Lecturer in English Simon Rottenberg (1965), Ph.D. (Harvard) Professor of Economics William Leal Rowe (1963), Ph.D. (Cornell) Associate Professor of Anthropology David T. Rowlands, Ir. (1966), M.D. (Pennsylvania) Associate Professor of Pathology Donald Francis Roy (1950), Ph.D. (Chicago) Associate Professor of Sociology OAssociate Professor of Sociology OAssociate Professor of Sociology OAssociate Professor of Sociology OAssociate Professor of Speech and Worship Associate Professor of Speech and Worship Associate Professor of Speech and Worship Associate Professor of Education Julian Meade Rudfin (1930), M.D. (Wirginia) Professor of Medicine Max R. Rumelhart (1965), B.Ed. (Gonzaga) Assistant Professor of Naval Science Ralph Wayne Rundles (1945), M.D., Ph.D. (Cornell) Professor of Medicine David Coston Sabiston, Jr. (1964), M.D. (Johns Hopkins) Professor of Surgery Harvey J. Sage (1964), Ph.D. (Yale) Assistant Professor of Biochemistry George Salamon (1966), Ph.D. (Harvard) Assistant Professor of Biochemistry Ceorge Salamon (1966), A.M. (Bryn Mawr) Lecturer in English Herman Salinger (1955), Ph.D. (Yale) Professor of German Herbert A. Saltzman (1958), M.D. (Philadelphia) Associate Professor of Radicine John Salzano (1958), Ph.D. (Lowa State) Associate Professor of Radicine John Salzano (1958), Ph.D. (North Carolina) Associate Professor of Radiology Charles Richard Sanders (1937), Ph.D. (Chicago) Professor of English Baxter B. Sapp, Jr. (1960), D.D.S. (Temple) Associate in Dentistry Mrs. Eugenia Curtis Saville (1947), M.A. (Columbia)		2811 Chelsea Circle
Assistant Professor of Medicine Annette T. Rottenberg (1965), M.A. (Harvard) Lecturer in English Simon Rottenberg (1965), Ph.D. (Harvard) Professor of Economics William Leal Rowe (1963), Ph.D. (Cornell) Associate Professor of Anthropology David T. Rowlands, Ir. (1966), M.D. (Pennsylvania) Associate Professor of Pathology Donald Francis Roy (1950), Ph.D. (Chicago) Associate Professor of Sociology OAssociate Professor of Sociology OAssociate Professor of Sociology OAssociate Professor of Sociology OAssociate Professor of Speech and Worship Associate Professor of Speech and Worship Associate Professor of Speech and Worship Associate Professor of Education Julian Meade Rudfin (1930), M.D. (Wirginia) Professor of Medicine Max R. Rumelhart (1965), B.Ed. (Gonzaga) Assistant Professor of Naval Science Ralph Wayne Rundles (1945), M.D., Ph.D. (Cornell) Professor of Medicine David Coston Sabiston, Jr. (1964), M.D. (Johns Hopkins) Professor of Surgery Harvey J. Sage (1964), Ph.D. (Yale) Assistant Professor of Biochemistry George Salamon (1966), Ph.D. (Harvard) Assistant Professor of Biochemistry Ceorge Salamon (1966), A.M. (Bryn Mawr) Lecturer in English Herman Salinger (1955), Ph.D. (Yale) Professor of German Herbert A. Saltzman (1958), M.D. (Philadelphia) Associate Professor of Radicine John Salzano (1958), Ph.D. (Lowa State) Associate Professor of Radicine John Salzano (1958), Ph.D. (North Carolina) Associate Professor of Radiology Charles Richard Sanders (1937), Ph.D. (Chicago) Professor of English Baxter B. Sapp, Jr. (1960), D.D.S. (Temple) Associate in Dentistry Mrs. Eugenia Curtis Saville (1947), M.A. (Columbia)	Wendell F. Rosse (1966), M.D. (Chicago)	
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Simon Rottenberg (1965), Ph.D. (Harvard) Professor of Economics William Leal Rowe (1963), Ph.D. (Cornell) Associate Professor of Anthropology David T. Rowlands, Jr. (1966), M.D. (Pennsylvania) Associate Professor of Pathology Donald Francis Roy (1950), Ph.D. (Chicago) Associate Professor of Sociology John Jesse Rudin, II (1945), B.D., Ph.D. (Northwestern) Associate Professor of Speech and Worship Mabel F. Rudisill (1948), Ph.D. (Wisconsin) Associate Professor of Speech and Worship Mabel F. Rudisill (1948), Ph.D. (Wisconsin) Associate Professor of Education Associate Professor of Rociology Professor of Medicine Julian Meade Ruffin (1930), M.D. (Virginia) Professor of Medicine Assistant Professor of Naval Science Ralph Wayne Rundles (1945), M.D., Ph.D. (Cornell) Professor of Medicine David Coston Sabiston, Jr. (1964), M.D. (Johns Hopkins) Professor of Surgery Harvey J. Sage (1964), Ph.D. (Yale) Assistant Professor of Biochemistry Ceorge Salamon (1966), Ph.D. (Harvard) Assistant Professor of Biochemistry Lecturer in English Herman Salinger (1955), Ph.D. (Yale) Professor of German Herbert A. Saltzman (1958), M.D. (Philadelphia) Associate Professor of Physiology Aaron P. Sanders (1956), Ph.D. (North Carolina) Associate Professor of Radiology Associate Professor of Radiology Associate Professor of Radiology Associate Roaders (1937), Ph.D. (Chicago) Professor of English Baxter B. Sapp, Jr. (1960), D.D.S. (Temple) Associate in Dentistry Mrs. Eugenia Curtis Saville (1947), M.A. (Columbia)		
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	Associate Professor of Music	1103 Anderson Street

Lloyd Blackstone Saville (1946), Ph.D. (Columbia) Professor of Economics 1103 Anderson Street *John Henry Saylor (1928), Ph.D. (Duke) 2500 Perkins Road Professor of Chemistry Harold Schiffman (1963), Ph.D. (Princeton) 3415 Hope Valley Road Associate Professor of Psychology John G. Schlogl (1963), A.M. (Columbia) Lt. Col., U.S.A.F. 132 Radcliffe Circle Professor of Air Science Knut Schmidt-Nielsen (1952), Ph.D. (Copenhagen) James B. Duke Professor of Physiology 627 Swift Avenue in the Department of Zoology †Peter Schonbach (1963), Ph.D. (Minnesota) Visiting Associate Professor of Psychology 2401 West Club Boulevard Fred W. Schoonmaker (1965), M.D. (Colorado) Assistant Professor of Medicine 1311 Anderson Street Daniel M. Schores (1965), Ph.D. (Missouri) Assistant Professor of Church and Community 2502 Tryon Road Charlene H. Schwab (1965), M.S.N. (Indiana) Instructor in Nursing 1000 Ruby Street Esther Louise Schwerman (1947), Ph.D. (Northwestern) Assistant Professor of English 909 Lambeth Circle Anne Firor Scott (1961), Ph.D. (Radcliffe) 1028 Highland Woods Associate Professor of History Chapel Hill, N. C. William Evans Scott (1958), Ph.D. (Yale) Associate Professor of History 1311 Dollar Avenue Richard A. Scoville (1961), Ph.D. (Yale) Assistant Professor of Mathematics 1411 Woodland Drive Will Camp Sealy (1946), M.D. (Emory) Professor of Thoracic Surgery 2232 Cranford Road Richard B. Searles (1965), Ph.D. (California) Assistant Professor of Botany 1708 Bedford Street James Hustead Semans (1953), M.D. (Johns Hopkins) Professor of Urology 1415 Bivins Street Walter E. Sewell (1965), Ph.D. (Harvard)
Adjunct Professor of Mathematics 1411 Woodland Drive Richard K. Seymour (1958), Ph.D. (Pennsylvania) Associate Professor of German 1311 Carolina Avenue Donald S. Shannon (1965), M.B.A. (Chicago) Instructor in Economics 4012 Hillgrand Drive Bobby Foster Sherwood (1965), D.V.M. (Georgia) Associate in Veterinary Medicine 5020 Autumn Drive Melvin G. Shimm (1953), LL.B. (Yale) Professor of Law 2429 Wrightwood Avenue William Warner Shingleton (1947), M.D. (Bowman Gray) Professor of Surgery 3866 Somerset Drive Barry M. Shmavonian (1958), Ph.D. (Washington) Associate Professor of Medical Psychology in Department of Psychiatry and Lecturer in Psychology 2744 Sevier Street Joseph Robert Shoenfield (1952), Ph.D. (Michigan) Professor of Mathematics 1700 Hillcrest Drive R. Baird Shuman (1962), Ph.D. (Pennsylvania) Associate Professor of Education 3609 Duke Homestead Road

[†] Through Fall Term 1966

James B. Sidbury, Jr. (1961), M.D. (Columbia)	
Professor of Pediatrics	4044 Nottaway Road
Herbert O. Sieker (1955), M.D. (Washington)	
Professor of Medicine	204 Forestwood Drive
Harold R. Silberman (1962), M.D. (Washington)	and Reimantan Deim
Assistant Professor of Medicine Donald Silver (1964), M.D. (Duke)	2718 Princeton Drive
Assistant Professor of Surgery	2419 Alpine Road
George Addison Silver, III (1946), M.D. (Duke)	2419 mpilie Road
Associate Professor of Psychiatry	3910 Dover Road
Ronald Simono (1965), Ph.D. (Wisconsin)	3320 20.01 2.002
Assistant Professor of Education	2705 Pickett Road
William Hays Simpson (1930), Ph.D. (Duke)	
Associate Professor of Political Science	1406 Dollar Avenue
David L. Singer (1965), Ph.D. (Yale)	
Assistant Professor of Psychology	2708 Legion Avenue
Leroy C. Skinner (1959), M.A. (Maryland)	0.0
Assistant Professor of Physical Education	2018 Sunset Avenue
D. Moody Smith (1965), Ph.D. (Yale) Associate Professor of New Testament	
	ent 53, 1911-C House Avenue
David Alexander Smith (1962), Ph.D. (Yale)	in 53, 1911-C House Avenue
Assistant Professor of Mathematics	2032 West Club Boulevard
David Tillerson Smith (1930), M.D. (Johns Hopkins)	
James B. Duke Professor of Microbiology	
Associate Professor of Medicine	3437 Dover Road
Donald S. Smith, II (1961), M.H.A. (Minnesota)	Atlas & Elba Streets
Assistant Professor of Hospital Administration	Apartment 1
Grover C. Smith (1952), Ph.D. (Columbia)	
Professor of English	503 Compton Place
Harmon L. Smith (1959), B.D., Ph.D. (Duke)	G E Madahan Amana
Assistant Professor of Christian Ethics Jesse Graham Smith (1960), M.D. (Duke)	601 East Markham Avenue
Professor of Dermatology	1118 Woodburn Road
Joel Smith (1958), Ph.D. (Northwestern)	1110 Woodballi Road
Associate Professor of Sociology	2712 Sevier Street
Peter Smith (1959), Ph.D. (Cantab.)	2,22 33333
Associate Professor of Chemistry	2711 Circle Drive
Robert Sidney Smith (1932), Ph.D. (Duke)	·
James B. Duke Professor of Economics	2236 Cranford Road
Wirt W. Smith (1957), M.D. (Texas)	
Associate Professor of Experimental Surgery	3301 Surrey Road
Ralph E. Snider (1960), D.D.S. (Ohio State)	n . n 1
Associate in Dentistry	2417 Bruton Road
George G. Somjen (1963), M.D. (New Zealand)	
Associate Professor of Physiology and Lecturer in the Department of Psychology	606 Buchanan Boulevard
Joachim R. Sommer (1957), M.D. (Munich)	000 Buchanan Boulevalu
Associate Professor of Pathology	2724 Sevier Street
Madison S. Spach (1958), M.D. (Duke)	2,24 557161 511661
Associate Professor of Pediatrics	2632 McDowell Street
Dorothy Spangler (1954), M.A. (North Carolina)	
Assistant Professor of Physical Education	2729 Brown Avenue
Bertel M. Sparks (1966), S.J.D. (Michigan)	
Visiting Professor of Law	2409 Perkins Road

Robert L. Spaulding (1965), Ph.D. (Stanford) Associate Professor of Education 2506 Francis Street Marshall Spector (1963), Ph.D. (Johns Hopkins) Assistant Professor of Philosophy 4 Holmes Circle Joseph John Spengler (1934), Ph.D. (Ohio State), D.Hu.L. James B. Duke Professor of Economics 2240 Cranford Road Alexander Spock (1962), M.D. (Maryland) Assistant Professor of Pediatrics 2414 West Club Boulevard George H. Spooner (1965), Ph.D. (North Carolina) 318 Severin Street Chapel Hill, N. C. Assistant Professor of Pathology Wilford Wayne Spradlin (1962), M.D. (Virginia) Assistant Professor of Psychiatry and Lecturer in Pastoral Care 1123 Woodburn Road David R. Squire (1962), Ph.D. (Rice) Visiting Assistant Professor of Chemistry 3509 Westover Road Ram P. Srivastav (1966), Ph.D. (Glasgow) Assistant Professor of Mathematics 14B Damar Court Apartments Olaf Stackelberg (1963), Ph.D. (Minnesota) Assistant Professor of Mathematics 1320 Clarendon Street William J. Stambaugh (1961), Ph.D. (Yale) Associate Professor of Forest Pathology 3211 Sherbon Drive Denis Keith Stanley, Jr. (1961), Ph.D. (Johns Hopkins) L-2A University Apartments Assistant Professor of Greek James L. Stanley (1966), B.A. (Syracuse) Associate Professor of Air Force Aerospace Studies 5204 Newhall Road Vivian T. Stannett (1961), Ph.D. (Brookline Polytechnic Institute) Adjunct Professor of Chemistry 34 Lake Shore Drive, Chapel Hill, N. C. Charles F. Starmer (1966), M.S.E.E. (Duke) Valley Park Road Associate in Biomathematics in the Department Terrace Apartment #9 of Community Health Sciences Chapel Hill, N. C. W. K. Stars (1966), M.A. (North Carolina) Instructor in Art 1916 Glendale Avenue Eugene Anson Stead, Jr. (1947), M.D. (Emory) Florence McAlister Professor of Medicine 2122 Campus Drive Donald John Stedman (1963), Ph.D. (George Peabody) Assistant Professor of Medical Psychology in Department of Psychiatry and Lecturer in Psychology Chateau Road Unnsteinn Stefansson (1965), Ph.D. (Copenhagen) Adjunct Professor of Zoology Beaufort, N. C. Robert S. Stempfel, Jr. (1958), M.D. (Vanderbilt) Professor of Pediatrics and Associate Professor of Physiology Box 55, Garrett Road Lionel Stevenson (1955), Ph.D. (California), F.R.S.L. James B. Duke Professor of English 3106 Devon Road Delford L. Stickel (1962), M.D. (Duke) Assistant Professor of Surgery 125 Newell Street William Frank Stinespring (1936), Ph.D. (Yale) Professor of Old Testament and Semitics 1107 Watts Street Donald E. Stone (1963), Ph.D. (California) Associate Professor of Botany 2706 Spencer Street Virginia Stone (1966), Ph.D. (North Carolina) Professor of Nursing 2511 Pickett Road Victor H. Strandberg (1966), Ph.D. (Brown) Assistant Professor of English

2709 Augusta Drive

John H. Strange (1966), Ph.D. (Princeton) Assistant Professor of Political Science 2307 Prince Street Jeanette Straub (1966), M.A. (Duke) Instructor in Nursing 2020 Pershing Street Howard A. Strobel (1948), Ph.D. (Brown) Professor of Chemistry 1119 Woodburn Road John W. Strong (1966), LL.B. (Illinois) 100 Radley Road Visiting Professor of Law Chapel Hill, N. C. W. A. Stumpf (1948), Ph.D. (Chicago) Professor of Education 127 Pinecrest Road Henry L. Sublett, Jr. (1962), Ed.D. (Virginia) Associate Professor of Education 1024 Southwood Drive Herbert P. Sullivan (1960), Ph.D. (Durham) Associate Professor of Religion and Lecturer in Old Testament 504 E. Markham Avenue John D. Sullivan (1958), Ph.D. (Michigan State) Associate Professor of Wood Science 2710 McDowell Street Elizabeth Read Sunderland (1939-42; 1943), Ph.D. (Radcliffe) Associate Professor of Art 6416 College Station Robert Oscar Swan (1961), A.M.L.S. (Pennsylvania) Lecturer in Department of Slavic Languages and Literatures 803 Buchanan Boulevard Louis Earl Swanson (1949), A.B. (Hamline) Associate Professor of Hospital Administration 2418 Wrightwood Avenue Charles Tanford (1960), Ph.D. (Princeton) Professor of Physical Biochemistry 1101 Norwood Avenue Dorothy Ellen Tate (1962), M.S. (Pennsylvania State) Associate Professor of Dietetics 923 Lambeth Circle Robert H. Tate (1966), B.A. (Vanderbilt) Assistant Professor of Naval Science 40 Parkwood Manor Robert S. Tate, Jr. (1965), M.A. (Indiana) Prince Street Instructor in Romance Languages *W. E. Cowell Taylor (1962), M.D. (Glasgow) Assistant Professor of Surgery V. A. Staff Quarters Marcel Tétel (1960), Ph.D. (Wisconsin) Associate Professor of Romance Languages 2310 Prince Street Ralph Edward Thiers (1960), Ph.D. (Toronto) Professor of Biochemistry 143 Pinecrest Road Walter Lee Thomas, Jr. (1932-35; 1937-42; 1945), M.D. (Virginia) Professor of Obstetrics and Gynecology 3619 Dover Road Edgar Tristram Thompson (1935), Ph.D. (Chicago) Professor of Sociology 138 Pinecrest Road Howard K. Thompson (1962), M.D. (Columbia) Assistant Professor of Medicine and Associate in Physiology 1406 Oakland Avenue Larry W. Thompson (1961), Ph.D. (Florida State) Assistant Professor of Medical Psychology in Department of Psychiatry and Lecturer in Psychology 3408 Hope Valley Road Robert W. Thompson (1966), B.S. (Maryland) Assistant Professor of Air Force Aerospace Studies 126 Larkspur Circle

John K. Tice (1966), A.B. (North Carolina)

Visiting Assistant Professor of Philosophy

7-H Towne House Apts.

Chapel Hill, N. C.

^{*} Through Fall Term 1966

John P. Tindall (1966), M.D. (Duke) Associate in Dermatology 4039 King Charles Road George T. Tindall (1961), M.D. (Johns Hopkins) Assistant Professor of Neurosurgery 1411 North Gregson Street Edward A. Tiryakian (1965), Ph.D. (Harvard) Associate Professor of Sociology 1523 Hermitage Court Bert R. Titus (1961) Assistant Professor of Orthosis and Prosthesis 225 West Woodridge Drive Russell F. Tomlinson (1959), Ph.D. (Florida) Assistant Professor of Medical Psychology in 410 Ridgefield Road Department of Psychiatry Chapel Hill, N. C. E. Clifford Toren, Jr. (1961), Ph.D. (Illinois) Route 3 Assistant Professor of Chemistry Hillsborough, N. C. Elias Torre (1951), Doctor en Filosofía y Letras (Madrid) Associate Professor of Romance Languages 1121 Anderson Street Daniel C. Tosteson (1961), M.D. (Harvard) 209AA, Route 1, Piney Mt. Road Professor of Physiology Chapel Hill, N. C. P. H. Trickey (1965), M.S. (Maine) Lecturer in Mechanical Engineering 112 West Lavender Avenue William G. Troyer (1965), M.D. (Oklahoma) Associate in Medicine 828 Louise Circle James Nardin Truesdale (1930), Ph.D. (Duke) Professor of Greek 105 Pinecrest Road Benjamin Trump (1965), M.D. (Kansas) Route 1 Associate Professor of Pathology Hillsborough, N. C. Gene M. Tucker (1966), Ph.D. (Yale) Assistant Professor of Old Testament 2210 Arrington Street Vance Tucker (1964), Ph.D. (California) Associate Professor of Zoology 412 Swift Avenue Arlin Turner (1953), Ph.D. (Texas) Professor of English 1115 Woodburn Road Mrs. Violet Horner Turner (1943), M.D. (Chicago) Assistant Professor of Obstetrics and Gynecology 2106 Summit Avenue Richard Lovejoy Tuthill (1953), Ed.D. (Columbia) Professor of Geography in the Faculty of Arts and Sciences 2709 Dogwood Road Malcolm P. Tyor (1955), M.D. (Duke) Professor of Medicine 810 East Forest Hills Boulevard Luella Jane Uhrhane (1947), M.P.H. (North Carolina) Associate Professor of Health Education 2712 Circle Drive Charles Rowe Vail (1939), Ph.D. (Michigan) Professor of Electrical Engineering 2730 Circle Drive William W. Van Alstyne (1964), LL.B. (Stanford) Professor of Law Box 256, Roxboro Road Robert Van Kluyve (1962), Ph.D. (Johns Hopkins) Assistant Professor of English 28 Lebanon Circle Vartan Vartanian (1961), M.D. (Cluj) Associate in Anesthesiology 2109 Farthing Street Jacinto J. Vazquez (1963), M.D. (Havana) Professor of Pathology 1707 Woodburn Road Mrs. Martha Delia Vazquez (1963), M.D. (Havana) Assistant Professor of Pathology 1707 Woodburn Road F. John Vernberg (1951), Ph.D. (Purdue) Duke University Marine Laboratory Associate Professor of Zoology Beaufort, N. C. John M. Vernon (1966), Ph.D. (Massachusetts Institute of Technology)

1024 West Markham Avenue

Assistant Professor of Economics

Adriaan Verwoerdt (1962), M.D. (Amsterdam) Assistant Professor of Psychiatry Route 1, Kerley Road Aleksandar S. Vesić (1964), D.Sc. (Belgrade) Professor of Civil Engineering 1722 Duke University Road Patrick R. Vincent (1954), Ph.D. (Johns Hopkins) Associate Professor of Romance Languages 1635 Marion Avenue F. Stephen Vogel (1961), M.D. (Western Reserve) Professor of Pathology Route 2, Box 381, Durham Steven Vogel (1966), Ph.D. (Harvard) Assistant Professor of Zoology 2014 Jersey Avenue Mrs. Christa von Roebel (1954), M.D. (Leipzig) Associate in Obstetrics and Gunecology 2303 Pershing Street Albert E. Wackerman (1938), M.F. (Yale) Professor of Forest Utilization 3610 Dover Road Joseph A. C. Wadsworth (1965), M.D. (Duke) Professor of Ophthalmology 1532 Pinecrest Road John P. Waggoner, Jr. (1957), B.D., B.S. in L.S. (North Carolina) Assistant Professor in the Faculty of Arts and Sciences 2812 Devon Road Stephen Andrew Wainwright (1964), Ph.D. (California) Associate Professor of Zoology 2539 Sevier Street Salih J. Wakil (1959), Ph.D. (Washington) Professor of Biochemistry 2527 Sevier Street Andrew Grover Wallace (1963), M.D. (Duke) Assistant Professor of Medicine 3511 Courtland Drive Lawrence G. Wallace (1961), LL.B. (Columbia) Associate Professor of Law 427 Green Street William Hall Wallace (1962), Ph.D. (Illinois) Assistant Professor of Economics 1108 West Knox Street Michael A. Wallach (1962), Ph.D. (Harvard) Professor of Psychology 2406 North Duke Street Richard L. Walter (1962), Ph.D. (Notre Dame) Assistant Professor of Physics 1614 Woodburn Road Hsioh-Shan Wang (1965), M.B. (National Taiwan University Medical College) Assistant Professor of Psychiatry 607 Central Avenue, Butner, N. C. Calvin Lucian Ward (1952), Ph.D. (Texas) Associate Professor of Zoology 1726 Duke University Road Charles Eugene Ward (1927), Ph.D. (Duke) Professor of English 2429 Perkins Road Bruce W. Wardropper (1962), Ph.D. (Pennsylvania) William H. Wannamaker Professor of Romance Languages 3443 Rugby Road Seth L. Warner (1955), Ph.D. (Harvard) Professor of Mathematics 2406 Wrightwood Avenue Richard Lyness Watson, Jr. (1939), Ph.D. (Yale) Professor of History 109 Pinecrest Road Paul W. Webster (1966), M.D. (Bowman Gray) Associate in Medicine 3819 Hillgrand Drive Edith Weiskopf-Joelson (1966), Ph.D. (Vienna) Visiting Professor of Psychology Statler-Hilton Inn Henry Weitz (1950), Ed.D. (Rutgers) Associate Professor of Education 2716 Circle Drive Bruce A. Wells (1964), M.S.E.E. (Oregon State) Associate Professor of Electrical Engineering 2729 Montgomery Street Richard L. Wells (1962), Ph.D. (Indiana) Box 225, Route 1

Assistant Professor of Chemistry

Randolph Road

m 1 m 1 l / 0 l D / C - m - ll)	
Paul Welsh (1948), Ph.D. (Cornell)	area Dagwood Road
Professor of Philosophy	2749 Dogwood Road
Martha L. Wertz (1960) M.S.W. (Tulane)	
Assistant Professor of Psychiatric Social Work	2717 Augusta Drive
Joseph Cable Wetherby (1947), M.A. (Wayne)	
Associate Professor of English	2604 Sevier Street
Gerald T. Wetherington (1966), LL.B. (Duke)	
Visiting Assistant Professor of Law	Route 3, Box 338G
Robert Whalen (1961), M.D. (Cornell)	
Associate Professor of Medicine	2708 Augusta Drive
Robert W. Wheat (1958), Ph.D. (Washington)	
Associate Professor of Microbiology,	
and Assistant Professor of Biochemistry	2108 Summit Road
Fred M. White (1959), M.F. (Duke)	
Assistant Professor of Silviculture	3323 Rolling Hills Road
Richard Alan White (1963), Ph.D. (Michigan)	33 0
Assistant Professor of Botany	215 Fleming Drive
George D. Wilbanks (1964), M.D. (Duke)	213 Tioming 21110
Assistant Professor of Obstetrics and Cynecology	3615 Dover Road
Karl Milton Wilbur (1946), Ph.D. (Pennsylvania)	3013 Bover Road
	A to A Bruton Road
James B. Duke Professor of Zoology Palent J. William (2007) Ph.D. (Michigan)	2404 Bruton Road
Robert L. Wilbur (1957), Ph.D. (Michigan)	-C Church Duine
Associate Professor of Botany	2613 Stuart Drive
Pelham Wilder, Jr. (1949), Ph.D. (Harvard)	337 1 1 3 4
Professor of Chemistry	2514 Wrightwood Avenue
Mrs. Hilda Pope Willett (1948), Ph.D. (Duke)	901 Wakestone Court
Professor of Bacteriology	Raleigh, N. C.
G. Trevor Williams (1965), Sc.D. (Johns Hopkins)	
Associate Professor of Mathematics and	
Associate Professor of Preventive Medicine	2702 Spencer Street
George Walton Williams (1957), Ph.D. (Virginia)	
Associate Professor of English	6 Sylvan Road
Donald S. Williamson (1966), Ph.D. (Northwestern)	
Assistant Professor of Pastoral Care	2503 North Duke Street
William Hailey Willis (1963), Ph.D. (Yale)	
Professor of Classical Studies	1419 Dollar Avenue
Neil L. Wilson (1957), Ph.D. (Yale)	-4-3
Professor of Philosophy	Route 2, Milton Road
Robert Renbert Wilson (1925), Ph.D. (Harvard)	Troute 2, million rions
James B. Duke Professor of Political Science	717 Anderson Street
Ruby Wilson (1959), M.S.N. (Western Reserve)	/1/ miderson buset
Assistant Professor of Nursing and Associate in Medica	ine 3006 University Drive
	the 3000 University Drive
Thomas G. Wilson (1959), Sc.D. (Harvard)	
Professor of Electrical Engineering	2721 Sevier Street
William P. Wilson (1961), M.D. (Duke)	***
Professor of Psychiatry	1209 Virginia Avenue
Cliff W. Wing, Jr. (1965), Ph.D. (Tulane)	
Associate Professor of Psychology	2111 Campus Drive
Halliman H. Winsborough (1962), Ph.D. (Chicago)	
Associate Professor of Sociology	2719 McDowell Street
Orval S. Wintermute (1958), B.D., Ph.D. (Johns Hopkins)
Associate Professor of Religion and	
Lecturer in Old Testament	1103 North Duke Street
Loren Ralph Withers (1949), M.S. (Juilliard)	
Associate Professor of Music	2741 Dogwood Road
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Benjamin Wittels (1961), M.D. (Minnesota) Associate Professor of Pathology 2308 Prince Street C. Hilburn Womble (1958), Ph.D. (Johns Hopkins) Assistant Professor of Latin Route 2, Box 38-B Max Atkin Woodbury (1966), Ph.D. (Michigan) Professor of Mathematics 4008 Bristol Road Barnes Woodhall (1937-43; 1945), M.D. (Johns Hopkins) Professor of Neurosurgery 4006 Dover Road Frank W. Woods (1958), Ph.D. (Tennessee) Associate Professor of Forest Ecology 1509 Pinecrest Road Robert Hilliard Woody (1929), Ph.D. (Duke) Professor of History 2734 Circle Drive Alma Lorraine Woodyard (1954), M.Ed. (North Carolina, Greensboro) Assistant Professor of Physical Education 880 Louise Circle Allan D. Wooley (1962), Ph.D. (Princeton) Route 1, Snow Hill Farm Assistant Professor of Classical Studies Bahama, N. C. Boyd T. Worde (1958), M.D. (Tennessee) Associate Professor of Radiology 2512 Sevier Street Mrs. Julia Ann Hedgepeth Wray (1955), M.F.A. (North Carolina, Greensboro) Assistant Professor of Physical Education 911 Carver Street James O. Wynn (1959), M.D. (Cornell) Associate Professor of Medicine 19 Oak Drive Alvin J. Wyrick (1966), B.S.E.E. (Tennessee) Associate in Radiology Box 3223, Duke Station William P. Yohe (1958), Ph.D. (Michigan) Professor of Economics 2021 Dartmouth Drive James G. Yoho (1956), Ph.D. (Michigan State) Professor of Forest Economics 2522 Sevier Street Charles R. Young (1954), Ph.D. (Cornell) Associate Professor of History 2929 Welcome Drive David L. Young (1966), M.D. (Texas) Assistant Professor of Medicine Country Club Drive Helen Rose Young (1957), M.S. (William and Mary) Assistant Professor of Nursing 5400 Newhall Road Paul Young (1956), M.A. (Illinois) Professor in the Faculty of Arts and Sciences 1110 Shepherd Street W. Glenn Young, Jr. (1954), M.D. (Duke) Professor of Surgery 3718 Eton Road Chester M. Zmijewski (1963), Ph.D. (Buffalo) Associate Professor of Immunology 3614 Westover Road William W-K. Zung (1966), M.D. (Texas)

Part Time Instructors

Associate in Psychiatry

Joseph J. Arpad, M.A. English Donald Carl Baldwin, M.S. Mathematics John C. Bailey, M.A. Chemistry Emily Whaley Balentine, B.A. Romance Languages

3308D Glasson Street

806 Maynard Avenue

903 West Murray Avenue

1013 Burch Avenue

Route 1, Box 106AA

William Nott Beard, B.S. Mathematics Reuben Raymond Belongia Mathematics Robert L. Bissell, M.A. Chemistry Linda B. Bourque, M.A. Sociology and Anthropology Carolyn J. Bowman, M.A. Romance Languages George Breckenridge, M.A. Political Science Iane A. Craig Burlak, M.A. Mathematics Clark R. Cahow, B.D. History William A. Calder, Ph.D. Zoology Douglas M. Carey, B.A. Romance Languages Everett Lowell Chrisman, M.L. Mathematics Maria Isabel Cid, M.A. Romance Languages *Joseph M. Crews, B.A. **Economics** Henry Humphreys Crockett, B.S. Mathematics Ronald W. Crowley, B.A. **Economics** Marilyn S. Darling, M.A. Botany Donald M. Davis, M.A. Zoology Randolph Charles Dickens, B.S. Mathematics John Woodward Eby Physical Education Richard R. Entwhistle, M.S. Mathematics Allaire A. George, M.A. Sociology Richard F. Glenn, V.A. Romance Languages William O. Goode, M.A. Romance Languages William R. Goodman, Jr., B.D.

2322 Broad Street 2723 Brown Avenue, Apartment F Men's Graduate Center 1411 Anderson Street 1106 Watts Street Route 1, Box 218 3409 Hope Valley Road, Apartment 6 3022 Chapel Hill Road Box 6214, College Station 743 East Franklin Street Chapel Hill, N. C. 1305 Rosemary Avenue 2318 Broad Street 1700 Hillcrest Drive, Apartment J Rufus Drive 1014 Minerva Avenue Elder Street, Carolee Apartment 8 2706 Augusta Drive 2510 Vesson Avenue, Apartment 1 1009 West Trinity Avenue 1806 Shelton Avenue 2422 Broad Street 3323G Glasson Street 2509 Wrightwood Avenue

2704 Sevier Street

1806 Shelton Avenue

2213 Elder Street, Apartment 14

Divinity

Patrick Gormely, B.A. Economics

Elizabeth W. Grant, M.A. Romance Languages

* Through Fall Term 1966

Economics 3309E Mordecai Street Wayne J. Holman, Ph.D. 41C Willow Terrace Physics Chapel Hill, N. C. Elizabeth Humphrey, M.A. Romance Languages 718 Underwood Avenue David Noel Jones, M.A. 18 Dawson Building Chapel Hill, N. C. History Ronald Jones, B.A. History 1804 Bivins Street James Emmett Jordan, Jr., M.S. Mathematics 3022 Chapel Hill Road, Apartment 22A Henry Jacob Katz, B.S. Mathematics 1019D Sherwood Drive Randall Kincaid, M.A. 861 Louise Circle Economics Ben M. Ladner, B.D. Divinity 942 Lambeth Circle, Apartment 3A August Robert Lawrence, R.S. Mathematics Route 3, Garrett Road Lawrence Lockwood, Jr., B.A. Romance Languages P.O. Box 2421, West Durham James Raymond Lord, Th.M. Religion 317 West Trinity Avenue, Apartment 1 Adeline McCall, M.A. P.O. Box 843 Music Chapel Hill, N. C. Ausonio Marras, B.A. 3308E Glasson Street Romance Languages Dale E. Means Mathematics 506 Watts Street Douglas M. Meeks, B.D. Divinity 3312D Mordecai Street Judith Louise Morganroth, B.A. Romance Languages Swift Avenue, Town House Apartments 18 Charles F. O'Keefe, Jr., A.B. Romance Languages 1208 E. Morreene Road Allen Freeman Page, B.D. Divinitu 2800 Lawndale Avenue Sally Rigsbee Page 1438 Ellis Road English Birger A. Pearson, B.D. Religion 222 E. Markham Avenue Charles W. Peek, III, M.A. Sociology & Anthropology 607 Maplewood Avenue William M. Penn, Jr., A.B. **Economics** 2318 Broad Street Raymond K. Perkins, Jr., B.A. Philosophy 2613 Legion Avenue Ruth Seifert Phelps, M.A. 2255 Cranford Road Music Louis F. Pisciottoli, A.B. 626-F Green Street **Economics** Donald E. Pursell, M.A. 2316 Huron Circle **Economics**

E. Wannamaker Hardin, M.B.A.

Richard Kenneth Reider, B.S. 1413 N. Mangum Street Mathematics Ronald C. Robinder, B.S. Chemistry Charles S. Rooks, M.A. Political Science Robert Roth, A.M. Sociology & Anthropology 1007 Alabama Avenue A. S. M. Saleuddin, Ph.D. Zoology Joseph Schneider, M.A. English David Peter Schorr, Jr., M.A. Mathematics David Ben Seligman, A.B. Philosophy Roland Seymour, Ph.D. **Botany** Duncan Sinclair, B.S. Mathematics David Sloane, M.A. English James Gray Smith, B.S. Mathematics Lerov P. Smith, S.M. Mathematics Earl K. Solenberger Mathematics Guy E. Spear, M.A. English Richard Stamelman, B.A. Romance Languages Allen F. Stein, M.A. English James W. Stines, B.D. Religion Alexander K. Tyree, B.S. Mathematics Charles N. Watson, Jr., M.A. English Kenneth Werrell, B.S. History Gary C. Wildman, B.S. Chemistry Robert L. Wineholt Chemistry 2100 House Avenue, Apt. 4 Jimmie Jack Wortman, M.S.E.E. Electrical Engineering Fred Arthur Wright, B.A. Mathematics

E-21 Westover Park Apts. Box 4020, Duke Station 104 Laurel Hill Road Chapel Hill, N. C. 2715 Beck Road 906 Buchanan Boulevard 2211-D Elder Street 1210-B Morreene Road 1019 East Sherwood Drive Apt. 17 900 West Trinity Avenue 886 Louise Circle 4116 Neal Road Pineview Circle 3323C Glasson Street 212 Edwards Street 2412 Vesson Avenue Apt. 7, Arrowhead 3406 B Mordecai Street 825 Wilkerson Avenue

3324D Glasson Street

1712 Euclid Road

3009 N. Duke Street

PO. Box 1165, Men's Graduate Center

900 West Trinity Avenue #18

718-B Iredell Street

William Wright, B.A. Romance Languages

William F. Wright, B.S. **Economics**

Research Associates

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